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SYPHILIS

AND

LOCAL CONTAGIOUS DISORDERS.

BY

BERKELEY HILL, M.B. Lond., F.R.C.S.,

PROFESSOR OF CLINICAL SURGERY IN UNIVERSITY COLLEGE; SURGEON TO UNIVERSITY COLLEGE HOSPITAL, AND TO THE LOCK HOSPITAL.

SECOND EDITION, ENTIRELY RE-WRITTEN.

BY

BERKELEY HILL,

AND

ARTHUR COOPER,

LATE HOUSE-SURGEON TO THE LOCK HOSPITAL, ETC.

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1881

PREFACE.

THE advance in our knowledge of Venereal Diseases since the First Edition of this work was published has been so great, that we have deemed it advisable to re-write the whole of the text. While doing this, we have endeavoured to include in the new edition the pith of what seemed to be most valuable among the vast quantity of literature that has appeared on this subject during the last thirteen years. It has thus become necessary to add a large amount of new matter, with the unavoidable result of adding very considerably to the size of the volume.

The department of Visceral Syphilis has most benefited by this augmented comprehension; indeed, the affections of the blood-vessels and of the growing bones were hardly recognized when the First Edition was issued.

The chapter on Syphilitic Affections of the Nervous System has been intrusted to Dr. W. R. Gowers, whose essay our readers will no doubt esteem, as we ourselves esteem it, one of the most valuable portions of the work.

The account of Syphilitic Diseases of the Eye has been revised and greatly improved by Mr. Nettleship, who has also enriched it with numerous statistics collected by himself.

Among other portions of this division of the book to which material additions have been made, the section on Contagion by Inheritance and the chapter on Prognosis may be mentioned. A short chapter on General Diagnosis has been inserted. The important question of Prophylaxis has also been treated in a separate chapter, which contains a summary of the latest published accounts of the effects of the Contagious Diseases Acts in preventing the spread of Venereal Diseases.

We adhere to a belief in the distinct nature of the Local Contagious Chancre from Syphilis.

In the divisions relating to Chancre, Gonorrhœa, and Accessory Venereal Disorders much new matter has been added, while some that had become obsolete—notably much of that relating to the so-called Syphilisation—has been omitted.

In the chapter devoted to the Treatment of Syphilis, as well as in the various sections on the treatment of the other Venereal Disorders, we have striven to include such improvements as have borne the test of experience.

Finally, the Formulæ referred to in the text have been placed together in a list at the end of the book.

BERKELEY HILL.
ARTHUR COOPER.

55, WIMPOLE STREET,
October, 1881.

THE PROPERTY OF THE N. YORK HOSPITAL

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DIVISION I.

INTRODUCTORY.

CHAPTER I.

HISTORY.

VENEREAL DISEASES are the contagious disorders propagated from one person to another, generally during sexual intercourse, and exceptionally, by other means of close contact between individuals.

There are three principal forms of disease:—SYPHILIS, CHANCRE, and GONORRHŒA. Besides these, there are also some less characteristic affections of the generative organs, depending on excessive or impure sexual intercourse, neglect of cleanliness, &c.

No question in the history of medicine has been more keenly debated, than the time at which syphilis first appeared. The descriptions of venereal diseases left to us by the ancients, satisfy us that they were familiar with ulcers and other affections of the genitals communicated by sexual intercourse, and further, make it highly probable that syphilis also was endemic at the time they wrote, without being recognised by them as a distinct disease. In describing the "shameful maladies," ancient writers do not unmistakably attribute to ulcers of the pudenda power to produce a sequence of general disease. For this reason, syphilis was believed until recently to have first appeared in Europe about the time it was first methodically described, namely, on Columbus's return from his discovery of the New World, in 1495. The persistence of this belief is mainly due to Astruc who, in the middle of the eighteenth century, published his Treatise on Venereal Diseases, in which he endeavoured to prove that the constitutional disease which we recognise as syphilis, did not exist earlier than 1492-5, when a plague raged throughout Europe which he believed to be syphilis reaping its first harvest; and there are still those who maintain this opinion. But efforts have been made of late to controvert

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this theory, more especially by Cazenave,[1] Follin,[2] and Lancereaux.[3] These writers enter into the question at some length, and adduce quotations not only from the ancient authors to whom Astruc had recourse, but also from others to whom he does not allude, to support their opinion that syphilis is a disease of great antiquity. They review the various writers of antiquity—medical, historical, poetic, and obscene—who mention affections of the genital organs. In the latter class, of course, research has been most abundantly rewarded by the discovery of new matter. In order to make as complete a survey as possible, Follin and Lancereaux divide the historical records into three divisions: first, those of antiquity; second, those of the middle ages; and third, those of the period reaching from the end of the fifteenth century to the present time—divisions that may be usefully retained.

In following this arrangement, we must not expect to find in the few medical books of antiquity a systematic description of the disease, because the ancients were ignorant of several of its features. But numerous quotations show it was well known that certain local affections were communicated by impure intercourse. They are so clearly described, that they appear identical with what we now know to occur in the outset of syphilis. Other diseases of a constitutional character are also described, such as caries of bones, and ulcers of the fauces, which physicians of that epoch looked upon as being, in some obscure manner, consequences of intercourse with diseased persons.

It must not be forgotten that syphilis does not always immediately attract the attention of those affected by it, for in many instances the immediate effects heal quickly without treatment. This peculiarity increases the difficulty of demonstrating a connection between the later forms of the disease and those of its invasion.

Literature of remote antiquity.—The sacred writings of the Bible contain no trustworthy account of syphilis. They merely furnish allusions to venereal affections of uncertain character.

The earliest notice of syphilis hitherto met with in the literature of India is in a Sanscrit treatise of medicine, written shortly after the commencement of our era,[4] entitled the "Ayurvedas" of Suçrutas,

[1] Cazenave: Traité des Maladies de la Peau. 1843.

[2] Follin: Pathologie Externe, tome i. 1862.

[3] Lancereaux: Traité Historique et Pratique de la Syphilis. 2nd edition, 1873. Lancereaux's work contains the most complete bibliographical record that has appeared on this subject in any language.

[4] Friedberg (Die Lehre von den venerischen Krankheiten in dem Alterthum und Mittelalter. Berlin, 1865, and Virchow's Archiv, Bd. 30, S. 251, 1864), says not earlier than 4th century, A.D.

and translated into Latin by Dr. Hessler.[1] In the chapter on diseases of the pudenda, Suçrutas describes, as consequences thereof, certain cutaneous affections, ulcers, ophthalmia, eruptions of the sole and palm, pustules of the scalp, swellings of the groin and armpit, &c. (Vol. I., ch. xiii. p. 196). Elsewhere he says that buboes should be allowed to open themselves; also, that sloughy parts of the penis should be removed with the knife, and the wounds anointed with oil. Follin appears inclined to accept this description of venereal disease in the "Ayurvedas," as affording satisfactory proof that the Hindoos understood the connection between general syphilis and local disease. From our examination of Hessler's translation, which is not very intelligible at this part, it seems to us that Suçrutas attributed the affections he describes, as much to the consequences of dirty habits as to any special poison transmitted from patient to patient; and the picture of the consequences of venereal taint is not a very close description of ordinary syphilis. But Friedberg procured a translation of this part from Sanscrit directly into German which describes the eruptions as being contagious, heritable and propagated by coitus—tolerably good evidence that the Hindoos recognised constitutional syphilis.

Klein, in a Latin treatise, written in 1795, on the mode of treatment practised in India for the cure of the venereal disease, states that Malabar physicians of the tenth century describe not only the disease Syphilis, but also its cure by mercury.

Hippocrates mentions various affections which correspond to those belonging to constitutional syphilis, but does so without distinctly ascribing to them a venereal origin. The Greek and Latin physicians whose works remain to us, also describe with more or less exactness the local ulcerations of the genital organs, and other affections resembling those of general syphilis. But they do not clearly attribute such ailments to a venereal taint. Celsus, in chap. xviii. of lib. vi., describes phimosis, and the ulcers often found on turning back the foreskin, which he even separates into the clear dry ulcer, and the moist suppurating one. He also observes that some ulcers spread deeply and widely; but the evidence of Celsus might be more distinct on this point. It is not plain that he was not describing cancers, and ordinary ulcers of the genitals. Aretæus mentions, without giving it a venereal origin, sloughing of the uvula and soft palate, &c. In Galen, the two following constitutional affections are mentioned, namely psoriasis scroti, and periosteal pain of so deep and fixed a kind, that the patient

[1] Suçrutas: Ayurvedas, id est medicinæ systema venerabili Dhanvantare demonstratum, a Suçrutas discipulo compositum. Nunc primum ex sanscrito in latinum sermonem vertit Fr. Hessler. Erlangen, 1844—1850.

believed the disease was in the interior of the bone. This, even in Galen's day, had received the name of osteocopic pain. Oribasis describes the moist and the dry ulcers of the pudenda and anus. Aetius also ascribes to aloes, used as a local application, the virtue of healing sluggish ulcers, fissures, and carbuncles of the anus and pudenda. Lastly, Marcellius Empiricus speaks of ulcers of the tibia which eat their way inwards. These quotations, which have been collected by Cazenave, Follin, and others writing more recently than they, are held by them to be sufficient proof that the ancients were familiar with contagious ulcers of the genitals, and that there were in their time two species of sore, the dry and the moist, which correspond to our infecting and non-infecting chancres. But they make it clear, nevertheless, that those who contracted venereal ulcers were also sometimes sufferers from other bodily ailments, closely resembling the syphilitic eruptions of the present day.

The satiric or erotic poems of Martial, Juvenal, and the Priapeia, furnish abundant allusion to, and even descriptions of, venereal diseases, not only of the genitals, but of the mouth, face, and groin. These constitutional diseases are also mentioned as being communicated by kissing as well as by sexual intercourse.

The various myths relating to the introduction of the worship of Lingam from India, and of Priapus into Greece, are important proofs of the ancients being thoroughly aware that sexual intercourse with infected persons communicated disease. It is recounted in the Myth of Lingam that a scourge, originating in Civa, was propagated thenceforth by transmission from women to men.

The amount of knowledge of venereal disease thus proved to have existed among the Hindoos, Greeks, Alexandrians, and Romans, may be fairly held to equal that possessed by them of other diseases of which the existence at that period is denied by no one.

The ancient medical literature of China is expected to furnish convincing proof of the antiquity of syphilis, but as yet indisputable evidence has not been obtained. Dabry[1] has published a work on Chinese Medicine, consisting chiefly of translations of their medical treatises. Verneuil[2] has written an excellent digest of this translation, whence our information is derived.

According to Dabry, the Emperor Ho-Ang-Ti, who reigned 2637 years B.C., caused the medical writings of that day to be collected into a systematic treatise, which has been amended from time to time; but it does not appear from Dabry's book whether an original edition still exists. His intention is rather to give an account of the present

[1] La Médecine chez les Chinois, par le Capitaine Dabry, Consul de France, &c., 8vo. Henri Plon, Paris, 1863.

[2] Verneuil: Archives Gén. de Médecine, 1863, tom. ii., p. 625.

condition of Chinese medical knowledge than to trace its antiquity. Notwithstanding these emendations, until quite recently little change in their knowledge of disease seems to have taken place for 2000 years. Therefore, it is probable that the very copious description of venereal disease in this book has at least that much antiquity.

Gonorrhœa was distinctly described in the time of Ho-Ang-Ti; and the later editions of the treatise contain clear accounts of chancre, phimosis, bubo, ulcers of the tonsil, sores around the anus, coppery eruptions of the skin, ulcers of the nose, and the cure of them by mercury. Even remedies for mercuric ptyalism are not omitted. Such evidence is very strongly in favour of the great antiquity of syphilis. Still, in consequence of Dabry not being aware of the importance his account of Chinese medicine would have in settling the question, he does not expressly state how early this precise knowledge of constitutional syphilis was possessed by the Chinese.

Syphilis in the Middle Ages.—Little of the medical literature of this period remains. Daremberg[1] quotes a manuscript of the ninth century, now in the National Library at Paris, which contains a very comprehensive enumeration of ulcers, fissures, warts, and condylomata of the anus; these affections, it further says, may also spread to or affect the genitals. In the thirteenth century, Richard the Salernitan, called also by many other names, says in his "Parvus Micrologus," that the penis and testicles often ulcerate from contact with the foul inflammatory humours secreted during menstruation. These ulcers, he remarks, are distinguished from others by their colour, by pustules of the skin, by the discharge, and by their itching, pricking, and heat. William of Saliceto also speaks of ulcers and fissures, which attack the penis after intercourse with a foul woman or a prostitute. In mentioning buboes, he describes the acute and indolent swellings of the groin, and says they are named "bubones," or "dragoncelli," and come when the penis is corrupted through coitus with a filthy infected woman, or from any other cause.

Lanfranco of Milan (1295) even separates ulcers which attack the genitals into three varieties, calling them ficus, cancer, and simple ulcers. Ficus was the old Roman term for piles, or growths round the anus. Lanfranco expressly states that these ulcers came from contagion as well as from other sources. He further speaks of ulcers that thicken the foreskin. The following anecdote goes to show that syphilis existed in the thirteenth century:—Bernard Gordon, who taught at Montpelier towards the end of the thirteenth century, mentions a certain countess, suffering from lepra, whose couch a bachelor of medicine was accustomed to share. The lady

[1] Daremberg: Annales de la Syphilis, vol. iv., p. 275.

became pregnant, and the student leprous. Others besides Gordon mention the contagious character of this kind of leprosy which, it is reasonable to suppose, was unrecognised syphilis. Michael Scotus and John of Gaddesden also distinctly state that scaly eruptions of the body and ulcers of the genitals result from intercourse with leprous women.

Thus it would appear that from the earliest time many of the affections have existed which at the present day are universally attributed to syphilis. The characters of some are those most distinctive of the disease,—the indolent bubo, the painful ulcers of the bones, the dry ulcer, the scaly eruptions of the skin, especially of the soles and palms. Besides, in the tenth century Indian physicians used mercury to cure a disease of venereal origin. This evidence having been written many years before the epidemic of 1490-6, should prove that not to have been the first appearance of syphilis in Europe, and goes far to establish its immemorial antiquity.

Syphilis at the end of the Fifteenth Century.—With respect to the suggestion, that Columbus's seamen brought syphilis into Europe from America, there is no doubt that an epidemic of some kind raged in many countries of Europe about the time of the discovery of America; but there is no doubt, also, that this plague reached its height in several countries before Columbus returned. The epidemic was cutting down hundreds in Naples in 1494, though Columbus's crews did not arrive there till 1495. In 1496 the parliament of Paris enacted measures to be taken against "the spread of a disease called the 'Grosse Verole,' which has been raging during two years in this kingdom." Hence, this pestilence had extended through France and other countries in 1493-4, and before Columbus returned.

Singular evidence in favour of the existence of syphilis in America before Columbus's discovery is furnished by Parrot,[1] who believes that he has found traces of syphilitic disease in skulls older than the European conquest of South America. But unfortunately for those who claim that these skulls prove the American origin of syphilis, Parrot has also found the remains of syphilitic morbid processes in the skulls removed from the Dolmens of France, thus carrying the existence of syphilis in Europe beyond the reach of history.

Notwithstanding this strong evidence of the antiquity of syphilis in Europe, several eminent writers in the last and present centuries have written learnedly in favour of the view that syphilis was really imported into Europe from America, where, according to theories,

[1] Parrot: Osseous lesions of hereditary Syphilis. Pathological Transactions, 1879, p. 349.

it was previously endemic. Astruc[1] quotes the evidence of Hernandez de Oviedo who, being sent to Hayti in 1513 to inspect the mines there, found the miserable slaves much infected with a disease which, in its various forms vividly described by Hernandez, closely resembled syphilis. His description of Hayti was published in 1525 at Madrid.

Recently, Montijo[2] in Madrid, Gaskoin[3] in London, and Edm. Bassereau[4] in Paris, have exerted themselves to revive interest in the view which regards syphilis as an importation from the New World. Gaskoin has translated the medical works of Villalobos from the Spanish; among them a poem by that learned Court Physician of the end of the fifteenth century, on which great stress is laid by those who maintain the American origin of syphilis. So far as we are able to judge from the translations, they do not materially affect the evidence heretofore obtained respecting the antiquity of syphilis in Europe.[5]

Fracastor,[6] a Veronese, the author of the Latin poem, "Syphilis," wrote, in 1555, a "Lucubration concerning the French Disease," taken from his second book on contagious diseases. His description of the epidemic which spread among the soldiers during the siege of Naples in 1494, shows that it was most probably syphilis. According to Fracastor it was contagious; frequently communicated during sexual intercourse, but also inherited by children from their parents. The first symptoms were fretting and chafing of the pudenda where hard ulcers formed; then came scabs on the skin, some dry and hard, others moist; ulcers of the throat, nocturnal pains in the bones, and further consequences common in syphilis, succeeded.

It is noteworthy that this plague of syphilis, when it became again endemic, quickly laid aside the symptoms and consequences it possessed while epidemic. Writers of the beginning of the sixteenth century describe the disease in characters pretty much the same as those it has retained without alteration ever since. But such a change, when epidemic disease becomes endemic, may happen. Even now syphilis, if it appear in a district where it was previously unknown, may assume a quasi-epidemic form. The outbreak in the sub-Apennine valley of Rivalta in 1860 has been given as an instance of this kind, besides some of more remote date related by Astruc and

[1] Astruc: De Morb. venereis. 1740.
[2] Montijo: Siglo Medico, 1860. Dec. 16.
[3] Gaskoin's translation of Villalobos, 1870, and *Medical Times and Gazette*, 1867, vol. ii., pp. 62, *et seq.*
[4] Edm. Bassereau: Origine de la Syphilis. Paris, 1873.
[5] See Hensler: Ueber dem westindischen Ursprung der Lustseuche. Hamburg, 1789.
[6] Turner's Extract of the Aphrodisiacus, 1736, p. 35.

others. The only epidemic characters on this occasion were its rapid spread among the inhabitants, and the very general appearance of a pustular eruption.

Again, when syphilis was introduced into the Society Islands, it spread with great severity, and became so general as to threaten the population with extermination. Still, it was marked by the same characteristics and by the same mode of propagation as it has in Europe at the present day. Corradi of Pavia[1] has lately published extracts from Italian manuscripts which are mainly contemporary descriptions of the syphilitic epidemic of 1490. They show that the disease, if not a completely new one, put on new and extraordinary characters. Still, the connection between ulcers of the genitals and skin eruptions, affections of the nose, throat, and bones was even then recognised.

It will be seen then that although the available evidence does not prove the immemorial antiquity of syphilis absolutely beyond dispute, it shows it to be highly improbable that syphilis originated at a period so recent as the fifteenth century. It seems more likely that, if syphilis were really a new disease in Europe in 1494-6, it was introduced from India or some Eastern country where there is little doubt of its being an old-established affection.

The several venereal diseases were not confounded with each other for some time after the discovery of syphilis. Early in the sixteenth century gonorrhœa was recognised as a contagious disorder distinct from venereal sores and syphilis. In Simon Fish's petition to Henry VIII.,[2] dated 1530, complaint is made against the Romish priests of that day that they were great spreaders of venereal disease, inasmuch as, "these be they that corrupt the whole generation of mankind in your realm; that catch pockes of one woman and bear them to another; that be burnt with one woman and bear it to another; that catch the lepry of one woman and bear it to another." Several treatises of the sixteenth century give a correct description of syphilis, and clearly define the distinct nature of the disease. Fernel says, in 1545, "The cause of the pox is a hidden contagious quality contained in an essence which serves for its vehicle and permeates the whole body." In the sixteenth century Fallopius, and in the seventeenth Thierry de Hery, accurately described the indurated ulcer and syphilitic eruptions of the skin as parts of the same disease.

Authors contemporary with these writers unluckily confused syphilis with other causes of ulcer of the genitals. Bassereau[3]

[1] Corradi: quoted by Quist: Virchow's Archiv. 1875. Bd. 64, p. 307.
[2] Quoted by Beckett: Philosoph. Trans., 1718, vol. xxx., p. 839.
[3] Bassereau: Affections de la Peau Symptomatiques de la Syphilis, pp. 239, 240. Paris, 1852.

quotes Georges Villa who wrote at the beginning of the sixteenth century and was the first to attribute all ulcers of the genitals to one virus. This theory was further established by Nicholas Massa in 1532. Notwithstanding the errors of these writers, some of their cotemporaries were aware of the local character of the sores which excited suppurating buboes, and their independence of the *morbus gallicus* or syphilis. Massa's view was gradually adopted by succeeding writers till the beginning of this century. This confusion increased until all venereal affections—syphilis, chancre, and gonorrhœa, were supposed to be the consequences of infection with one poison. Thus the belief in the unity of the virus of venereal affections was a work of time and repetition.

The independence of the local chancre from syphilis was, in 1783, again suggested by Hensler,[1] who collected extracts which clearly prove that local venereal ulcers and urethral fluxes were perfectly familiar to medical writers before the end of the fifteenth century; he also remarks that mercury is not necessary for the cure of non-syphilitic venereal diseases.

From among authors who wrote on venereal diseases in the eighteenth century, we must not omit John Hunter. In 1786 he published his celebrated "Treatise on the Venereal Disease." Though attributing all venereal diseases to one virus, Hunter's work contains proofs of the truth of many doctrines at that time undreamed of in syphilitic pathology. Of these may be mentioned; contagion from secondary infection, and the incubation period of the syphilitic poison. Though these facts were not recognised by Hunter himself,[2] they can be easily discovered in his accurate descriptions of the course of the disease.

Avoiding Hunter's error, Benjamin Bell[3] in 1793 separated gonorrhœa from syphilis and chancre; but Balfour[4] had in 1767 expressed a strong opinion in favour of the non-identity of the two diseases.

In the present century Rose, Hennen, and other English writers pointed out that many venereal ulcers heal by simple non-mercurial treatment and are not followed by any general eruption; but without indicating, so far as can be earned from their writings, that such local affections have an origin separate from syphilis.

Abernethy[5] has often been credited with distinguishing between non-syphilitic venereal sores and syphilis because, in his "Essay

[1] Hensler: Geschichte der Lustseuche, die zu Ende des XVten Jahrhunderts in Europa ausbrach. Altona, 1783.
[2] Palmer's edition of Hunter's works, vol. ii., pp. 471 and 475. 1835.
[3] Benjamin Bell: "Treatise on Gonorrhœa Virulenta and Lues Venerea." 2 vols. Edinburgh, 1793.
[4] F. Balfour: "Dissertatio de Gonorrhœa Virulenta." Edinburgh, 1767.
[5] Abernethy: Surgical Observations. 1804.

on Diseases resembling Syphilis," he reserves the term syphilis for cases where the disease begins with a hard elevated ulcer which is sufficiently obstinate to need mercury for its cure. Observation showed him that some venereal diseases would often cease without treatment. Sometimes this took place even when the sore was accompanied by well-marked syphilitic eruptions. He gives an example at page 10 of the Essay:—A man had intercourse with his friend's mistress, and a few days afterwards found several ulcers on his penis, for which Abernethy urged him to take mercury to prevent constitutional disease. The patient objected, because both the friend and the mistress were healthy. In course of time the ulcers healed, and nothing more came of his sores. The patient yielded to temptation a second and even a third time, with a like result on each occasion. Abernethy supposed that this was not a case of syphilitic contagion, simply because mercury was not necessary for its cure. Unfortunately, Abernethy included other cases, where syphilis was undoubted, in the list of pseudo-syphilitic affections, because they recovered without mercury.

In 1814, Carmichael,[1] perceiving that general disease did not always follow contagious ulcers, subdivided venereal affections into four chief classes, each of which he maintained had a distinct exciting poison, a peculiar primary manifestation, and a separate series of constitutional affections. Further, while attributing the different series of symptoms to particular kinds of venereal ulcers, he decided that many were not syphilitic, because their primary ulcers were not Hunterian chancres. His doctrines were completely refuted by Bassereau's careful observations published in 1852.

During this long period many other theories as to the nature of syphilis have been set up at different epochs—theories of most various and contradictory kind, among the most paradoxical of which was, perhaps, that of Broussais and his school, who maintained, during the early part of the present century, that what is called syphilis is an artificial collection of a number of distinct diseases, there being no such thing as a syphilitic poison.

Unrecognised forms of Syphilis called by different names.—Several endemic maladies limited to certain districts were, in the seventeenth and eighteenth centuries, supposed to be peculiar affections; but they are now generally believed to be syphilis. Among the difficulties that prevented earlier recognition of these affections as syphilitic, was the absence of suppurating chancres, buboes, and gonorrhœa,—affections at that time considered part of syphilis, but which are really only accidental complications. Again, because these

[1] Carmichael: "Essay on the Venereal Diseases which have been confounded with Syphilis." Dublin, 1814.

diseases were commonly propagated by kissing, suckling diseased infants, or by using spoons employed by diseased persons—modes of contagion which do not favour the production of suppurating ulcers and discharges — they were held to be non-syphilitic in nature. Sometimes these affections were localised in secluded districts and, spreading among individuals of closely similar habits, acquired special characters which made them differ still more from ordinary syphilis; or they became confounded with other diseases, like the radezyge of Norway, which consists of syphilis and leprosy. Lancereaux[1] has made an excellent abstract of the literature on this subject, including, with many others, the essays of James Thomson,[2] Paulet,[3] Rollet,[4] and Boeck,[5] on these unrecognised forms of syphilis. Both Thomson and Paulet practised in the West Indies, having medical charge of the negro labourers of different estates. Rollet has digested the writings of various authors on these obscure diseases. These investigations show how completely they are identified with syphilis.

Yaws (framboesia, pian) is the best known and described of these diseases. It prevailed among the negroes of the coast of Guinea; and by the transport of negroes to the West Indies, it also spread among those islands and through the Southern States of America. Many authors, chiefly English, Dutch, and French, wrote on this disease in the eighteenth century. Sir Hans Sloane describes what he saw in a voyage to Madeira, St. Kitts, and Jamaica. John Hunter,[6] writing "on diseases resembling the lues venerea, which have been mistaken for it," describes a case of yaws that was clearly syphilis, for the very reasons he advances to prove it could not have been that disease.

The first symptoms of yaws are lassitude, malaise, and even fever; presently little buttons (papules) or pustules follow, which ulcerate under the scab. The papules are scattered over the body, being sometimes arranged in circles or found round the mouth and anus; the papules often become prominent and vascular, and bleed easily. In this state they resemble the wild raspberry, whence the name framboesia. Yaws is not only contagious, but is said to be propagated only by the contamination of a breach of surface with the yaws' discharge. Paulet inoculated an infant with the matter of yaws. The punctures healed, retained the appearance of light scratches for three weeks, and then became hard uneven ulcers. Seven

[1] Lancereaux: Traité Historique et Pratique de la Syphilis, 2nd edition, p. 23. Paris, 1873.
[2] Thomson: Edinburgh Med. Surg. Journal, vol. xv., p. 321, and vol. xviii., p. 32. 1819.
[3] Paulet: Archives Générales de la Médecine. 1848—1849.
[4] Rollet: Recherches sur la Syphilis. 1860.
[5] Boeck: Traité de la Radezyge. 1860.
[6] Hunter's Works, Palmer's edition, vol. ii., p. 471.

weeks after the inoculation, an eruption broke out on the body and lasted nine months. Children inherit the disease from their parents, and communicate it to those who suckle them. Again, this affection occurs but once, and its most effectual remedy is mercury. There are other points showing its identity with syphilis, such as ulcers of the throat, and pains in the bones. Though both James Thomson and Paulet were aware of the good effect of mercury in this disease, they seldom employed it, as they feared the mischief which salivation might cause among the negroes. They separated the sick from the healthy, fed and housed them well, and found that the disease often subsided altogether in seven months, though it was sometimes prolonged for two or three years by relapses of various kinds.

The clearest and most impartial report on yaws which has appeared recently is that of Dr. Gavin Milroy.[1] This report, while mentioning that many of the colonial surgeons who have most experience in it, believe that yaws is not syphilis, gives a description that differs in no way from the exact and clear accounts furnished by Thomson, Paulet, and others. Hitherto no post-mortem examinations of persons dying of yaws have been published. Excluding this, nothing is wanting to describe syphilis when describing yaws.

Sibbens, or *Sivvens*, was a disease confined to the south-west of Scotland, Dumfriesshire, and Galloway. It was very prevalent through the seventeenth century, and was popularly supposed to have been introduced by the troops of Charles the Second's army in their campaigns. It much resembled yaws in its eruption, and has long ceased to be distinguished as a separate disease.

Radezyge, which first attracted attention in the eighteenth century, is a variety of syphilis endemic in certain fishing towns of the north of Norway and Sweden. Boeck was appointed by the Swedish Government to investigate the disease. In his official report he shows that it differs in no way from syphilis, though often mingled with elephantiasis grecorum or leprosy, which is very prevalent in the same district.

Scherlievo.—On the coast of the Adriatic, Dalmatia, and Croatia, where the people are ill-fed, very dirty, and ignorant, syphilis at the beginning of the present century again assumed some peculiarities which obscured its real nature, and procured it a local name before its true character was discovered.

[1] Report on Leprosy and Yaws in the West Indies, presented to Parliament, March, 1873. See also the Report for 1878 by Dr. Nicholls, Colonial Surgeon of Dominica, West Indies, who is himself sceptical concerning the identity of yaws with syphilis. *Brit. Med. Jour.*, Dec. 6, 1879.

Mal Anglais, Mal de la Baie de St. Paul.—In the middle of the eighteenth century syphilis invaded the upper part of Canada. Several tribes of Indians, hitherto strangers to the disease, were rapidly and widely infected by it. The sudden increase and extent of the evil diverted men's attention from its real nature, and it was variously described. It spread also among the fishing population of the Bay of St. Paul, whence it has received its various names.

Several other local names have been given to various other outbreaks of the disease, of which *Amboyna Button, Maladie de St. Euphemie,* &c., are examples.

Prevalence of Syphilis.—With one or two exceptions syphilis is met with throughout the world, being most general among communities on the coast, where there is much communication with ships from foreign parts, whence sailors spread the disease among the population. Throughout Europe, especially in all large cities or thickly populated districts, it is rife. Some out-of-the-way country places are still almost free from it, but none absolutely so. Iceland is said, notwithstanding the frequent introduction of syphilis by the sailors of whaling ships, to be very little subject to it. The inhabitants of the interior of Morocco suffer greatly from syphilis. According to recent travellers it affects whole tribes, and is developed in most severe and disgusting forms.[1] In Russia, according to Dr. Podolinski,[2] syphilis is a principal scourge of nearly the whole country, especially in the southern parts, namely in the Governments of Kiew, Poltava, and Theringnon. In some of the villages a third of the inhabitants are contaminated. In Taroslawka, of 120 families, thirty are certainly syphilitic and sixty-four only are *known* to be healthy. The influence on mortality is very great: of the infected families hardly any pass the age of sixty, while the death-rate of the syphilitic families is more than one half greater than that of the remaining population. Marriage and heredity are the principal means of its spread, but in the Government of Kiew a practice prevails during the beetroot harvest, for the sugar manufacturers to allow the promiscuous association of the sexes. Thus, during these periodical assemblages of the population of distant villages, much disease is propagated, to be still further disseminated when, harvest being over, the infected return to their own homes. Hjelt[3] ascribes the prevalence of syphilis among both urban and rural populations of Finland to the habits of the people, especially to their custom of living several

[1] Amicis: Morocco; its people and places. Translated by C. Rollin-Tilton, 1880, p. 128.

[2] Podolinski: *La Médecine Contemporaine,* reporting the proceedings of the Medical Congress of Montpellier in 1879, of which report an abstract is given in the *Lancet* of October 25, 1879.

[3] Hjelt: Die Verbreitung der Ven. Krankheiten in Finnland. Berlin, 1874, S. 14.

families together in one house, using clothes, bedding, towels, cups, spoons, pipes, &c., in common. The Finns are also fond of being cupped, and the cuppers who travel from village to village often convey syphilis, and sometimes inoculate by means of their cupping instruments dozens of persons at a sitting. In the village of Hakola, in 1858, one woman, herself syphilitic, inoculated syphilis upon about two hundred persons with her cupping apparatus. Travellers among savages report syphilis to be spread wherever Europeans have reached them, while there is no doubt that it is widely disseminated among the old civilised races of China, India, and Japan.

The extent to which syphilis affects the population of the United Kingdom is very difficult to measure; the following facts are put forward in order to furnish the reader with some perception of the amount of its prevalence. In 1867 the Harveian Society of London appointed a committee of its members to collect information that might serve in calculating the prevalence of venereal disease among the sick population of our large towns; and in 1868 the Association for the extension of the Contagious Diseases Acts, re-produced this information with additional facts procured by its own agents.

The large proportion of the sick poor who seek relief at our London Hospitals, on account of venereal diseases, will give some idea of the prevalence of syphilis. At Guy's Hospital forty-three per cent. of the whole number of out-patients annually treated in that institution, suffer from venereal disease.[1] At special hospitals, a large proportion of the disease treated has a syphilitic origin: at the Hospital for Diseases of the Skin, ten per cent.; at the Hospital for Diseases of the Throat, fifteen and a half per cent.; and at the Moorfields Eye Hospital, about twenty per cent. of the patients are afflicted with syphilitic disease.[2] These data are beyond dispute, but are insufficient for forming an estimate of the general prevalence of venereal disease, and particularly of syphilis, among the sick population of our large towns and rural districts. In the latter, doubtless, the amount of venereal disease is much less, though the great improvement in the modern means for travelling to and fro, by facilitating the access of townspeople to country districts and by enabling country people to visit large towns, much favours the spread of venereal disease even into remote rural districts. In 1871 the Medical Officer of the Privy Council instituted an investigation into the numbers of those treated for venereal disease at our public charities and Poor Law infirmaries.[3] In this report it was calculated that about seven per cent. of the sick poor treated in these institutions suffer from

[1] Report of the Committee of the Harveian Society of London on the prevalence of venereal disease. 1867.
[2] First report of the Association for Extending the Contagious Diseases Act. 1868.
[3] Eleventh Report of the Medical Officer of the Privy Council. 1871.

venereal disease of some kind, of which one half, or three and a half per cent., are infected with constitutional syphilis. This estimate, from the mode in which its data were collected, was obviously incorrect; for in these returns no account was taken of Guy's Hospital, nor of the Hospital at Greenwich for merchant seamen, nor of the male out-patients of the Lock Hospital, nor of some other institutions which have a particularly large number of venereal patients. It must be admitted, therefore, that the precise amount of syphilis prevailing in London is much larger than this official report would lead us to believe. In special classes, soldiers and sailors for example, the exact returns which are furnished of their health give a correct estimate of the amount of venereal sickness from which they suffer. Further information on this subject will be found in another chapter.

INTRODUCTORY.

CHAPTER II.

MODERN VIEWS.

The Unicist Theory.—The original Unicist Theory held that all venereal diseases were due to a single virus; but this view has been gradually abandoned since 1838, when Ricord by his demonstrations completed the chain of evidence begun by Bell in 1793, and thus clearly separated gonorrhœa from other venereal disorders. But though gonorrhœa is now universally acknowledged to be a distinct disease, the relation of syphilis to the local contagious ulcer is still a matter of dispute; and the term "*Unicist*" is now used to denote those who believe that all primary venereal sores are excited by the syphilitic virus.

The Dualist Theory.—In 1852, Bassereau, with the view of elucidating the cause of the differences in venereal sores, compared a large number of patients suffering from those affections with the persons by whom they had been infected. These researches led invariably to the same conclusion, viz.—that whenever the infected person had constitutional syphilis, the infecting person was also found to be similarly diseased: and conversely, whenever the infecting person was free from syphilis, the infected also showed none but local disorders.

In 1858, Ricord acknowledged himself convinced by Bassereau's observations of the existence of two distinct kinds of contagious venereal sores—one of necessity a part of general or constitutional syphilis; the other a purely local disorder without any general action on the system of its bearer. Thus was established the modern form of "*dualism.*"

Among those who admit the truth of Bassereau's conclusions, there are some who maintain that there still remains to be explained some apparent relationship of the local ulcer with the primary lesion of the constitutional disease.

This question will be more fully discussed in the chapter on "Diseases confounded with Syphilis."

The dualist theory will be adopted in our description of venereal diseases. The term *chancre* will be applied solely to that affection which is characterised by irritation, ulceration, and the secretion of contagious matter at the point of inoculation. The furthest complication of this ulcer is inflammation of the nearest lymphatic glands, either from sympathy or from entry into the gland itself of irritant matter from the sore. The term *syphilis* will be confined to the general or constitutional disease which displays phenomena at the point of inoculation distinct from those of chancre. Any resemblance to chancre which the manifestations of syphilis occasionally assume, is of an accidental kind, due either to inflammatory irritation, or to concomitant contagion of chancre with syphilis—an event which often takes place.

DIVISION II.

SYPHILIS.

CHAPTER I.

OUTLINE.

Synonyms.—Constitutional Syphilis: Pox; Morbus Gallicus; Verole; Maladie de Naples; Lustseuche; Französische Krankheit.

Definition.—Syphilis is a specific disease communicated to the sound solely by contact with the fluids of the diseased. A certain interval exists between the absorption of the poison, and the manifestation of its effects. The poison is conveyed throughout the body by the blood. As all the tissues are contaminated, the effects of syphilis are displayed both on the surface of the body and internally. The natural course of the disease is to recovery. After one inoculation the individual is protected from a second attack. Syphilis differs from the other specific diseases in its poison being strictly non-infectious; in its course being chronic and liable to frequent relapses, but also capable of being greatly influenced by certain drugs.

General sketch.—When the syphilitic poison has been inoculated, it gives no evidence of its presence for three weeks or a month; this period is called its *incubation*. The disease then reveals its presence by induration of the tissue at the point of inoculation, and by the formation of an elevated papule which may or may not become an ulcer with a hard base. About ten days after the appearance of the papule, the group of glands nearest to it are found to be enlarged. Within a few weeks from this, usually five to six, a red macular eruption appears on the chest and abdomen, and sometimes spreads to the face and limbs. It may be unperceived by the patient, as it causes no discomfort. This rash is often preceded by headache and loss of appetite, and sometimes by fever. As the first eruption disappears others develope, generally of a papular character, scattered over the surface of the body and on the mucous membrane,

especially that of the fauces and tonsils. Emaciation and loss of strength sometimes set in at this period, but more often the patient preserves his appetite and bodily power. Having made this progress, the disease may subside completely, and never revive. Usually however, after two or three months of apparent quiescence, a fresh eruption of a scaly or, less commonly, of a pustular character, appears on the skin, with excoriated patches on the fauces. These are accompanied in the more severe cases by rheumatoid and periosteal pains in the bones, iritis, &c. The affections either become continuous by fresh crops of eruption following closely on each other, or they alternately vanish and return, during a period ranging between two or three months and two or three years. During this time the patient's strength and vigour are generally much diminished. Thus the second period of the disease terminates. Should it go further, as sometimes happens, a new series of morbid processes occupies the body. If the skin be attacked, hard tubercles, which are very prone to ulcerate, appear in that tissue. The internal organs also may be the seat of similar new growths.

Syphilis, *per se*, is rarely fatal in adults; but by altering the structure and impeding the function of organs of vital importance, it renders the patient unable to resist the inroad of morbid action set up accidentally, and thus, indirectly, frequently causes death.

The course, severity, and duration of syphilis are greatly influenced by many circumstances: for example, age, climate, exposure, habits, the strength of the patient's constitution, &c. These will be fully considered further on. The greater or less severity of the disease in the person from whom contagion is derived, appears seldom to have any appreciable influence on the course of acquired syphilis; but the offspring of syphilitic persons usually suffer the more severely, the greater the activity of the poison in their parents.

For convenience of description the symptoms of syphilis may be arranged in three groups. First, those developed at the point of contagion—the so-called "primary manifestation." Next, the general and usually superficial affections—the so-called "secondary symptoms." Lastly, the lesions which attack only a limited portion of the surface of the body or of the deeper structures—commonly known as "tertiaries."

These three groups of symptoms are usually separated by pauses; but now and then patients have symptoms proper to all three periods present at the same time, showing that the distinction is more artificial than real. The close connection of the processes of these three periods is shown by Virchow, who finds the histological

structure of the morbid productions to be identical throughout the different organs at all stages of the disease. Under the microscope, the new product is seen to be the same both in the indurated site of the inoculation of the poison and in the tumour of the liver and other parts in cases where the disease has long existed. By many it is believed that the distinction between the earlier and later stages of syphilis is very real. According to them, the nature of the disease has undergone considerable change when its later stages are reached. In their opinion, syphilis proper ends with the cessation of the secondary symptoms; its later effects, the gummy tumour for example, being sequelæ or consequences rather than component parts of the disease itself.[1]

Visceral Syphilis.—Every tissue of the body is, in all probability, liable to be attacked by syphilis, both in the acquired and in the inherited forms of the disease. It is true that in a few organs the presence of syphilis has not yet been incontestably proved; still the exceptions are very few, and their number diminishes year by year as the bodies of syphilitic persons are more fully and thoroughly examined after death, and our knowledge of the morbid anatomy of the disease thus becomes more accurate.

Syphilis may attack the viscera in two ways: first, by the development of an interstitial *hyperplasia*, which diffuses itself through a smaller or larger portion of the viscus; second, by the formation of circumscribed swellings known as *gummata*. In minute structure these two forms of growth are almost identical, the chief difference between them being that in the diffused form the morbid growth invades a portion, or, though rarely, even the whole of an organ, without any definite line of demarcation; while in the circumscribed form the gumma is surrounded by a well-defined investment composed of vascular fibrous tissue, which contrasts sharply with the surrounding normal structure of the viscus.

The specific change consists essentially in the formation of an embryonic connective tissue which undergoes various processes of development and degeneration. *In the diffused form* the cellular tissue composing the framework that supports the proper parenchyma of the organ undergoes increase of its cell-structure. This material becomes converted finally into an indurating and contractile fibrous tissue, whereby the parenchyma of the organ is compressed and its function seriously affected or even destroyed.

The circumscribed gumma is often connected with the infiltrating form of new growth. In the liver, for example, a portion of the gland may be strewn with gummata, around which radiating fibrous

[1] A full discussion of this subject will be found in the Pathological Transactions for 1876.

bands penetrate and form deep irregular or stellate scars. The gumma, in its most characteristic form, appears as a yellowish, tough, and somewhat elastic mass surrounded by a fibrous capsule well supplied with blood-vessels.

In nearly all cases, if not always, the new growth begins in the outer part of the tunica adventitia of a small artery, where it grows by successive layers. Thence it may extend along the cellular tissue in which the artery courses, deeply into the parenchyma of the organ,[1] producing nodular masses or processes which gradually lessen in size and end abruptly by the side of the arteriole in the coats of which they develope. The change consists in a growth of round or oval cells with distinct nuclei and nucleoli, embedded in a nucleated stroma,[2] being thus essentially of the nature of granulation-tissue. It will be seen therefore, that the syphilitic neoplasm is wholly formed of elements common to other growths, but varying according to the structure of the organ in which it is found.

Gummata often disappear, but the products of cicatrisation probably remain permanently in all cases. The diffused infiltration is probably capable of absorption only while still in the stage of embryonic connective tissue.

The effects of the morbid growth on the organ in which it is developed are several. One of the earliest is blocking of the artery in the coat of which it originates. As a consequence of this obstruction, not only may the part of the viscus supplied by the artery necrose or degenerate, but the same results may occur in the neoplasm itself. Hence necrosis, caseation, or calcification is very constantly met with in the central part of the growth; but suppuration of a visceral gumma is an extremely rare occurrence. A further effect on the viscus is compression or invasion of its proper tissue: in the lung, for example, the alveoli may be squeezed together and obliterated, or they may be thickened or even destroyed by the growth of gummy material in their walls.

The changes produced by syphilis are briefly summarised by Lancereaux,[3] as follows:—"This disease (syphilis) attacks primarily only those tissues which are formed from the middle layer of the blastoderma, particularly the elements of the lymphatic system. The alteration in the tissues derived from the internal and external layers are always secondary. Syphilis manifests itself by lesions which are slow in development, excentric, and whose type is 'embryonic connective tissue.' The new formations may disappear

[1] Gowers: Cerebral Syphiloma: mode of growth. Path. Trans. 1877, p. 280.
[2] Greenfield: Path. Trans. 1876, p. 429.
[3] Lancereaux: Bulletin de l'Académie de Médecine. 1877, Oct. 23.

by absorption, or by elimination, but sometimes become organised into definite homologous tissues (osseous in bone, lymphatic in glands, cicatricial in connective tissue)."

The peculiar changes due to syphilis which have just been described, are not usually seen until several years after contagion; still, sufficient evidence has been collected to show that the internal organs may be invaded at a much earlier period, for undoubted examples of gummata in the heart and other important organs during the exanthematous stage have been recorded, and will be again referred to in the following chapters.

Further knowledge of the morbid anatomy of early syphilis is much needed; but death during this period is of rare occurrence, consequently opportunities of examining the internal organs are necessarily few.

Other important sequels of syphilis, though not solely produced by it, are Lardaceous disease, Fibroid disease, and Rickets.

Lardaceous disease is probably the most frequent visceral affection found in those who die from late or "tertiary" syphilis. Fagge[1] collected the particulars of 244 cases of lardaceous disease of the viscera, which were examined after death in Guy's Hospital during twenty-one years, and found that in seventy-six there was satisfactory proof of the existence of syphilis.

Fibroid disease may be a consequence of the diffused hyperplasia, and is frequently seen in the lungs of patients who have had syphilitic disease elsewhere. But this variety of fibroid change has nothing peculiar to syphilis in its formation, and consequently is still repudiated as a syphilitic affection by certain pathologists.

The connection of *Rickets* with syphilis is, again, not clearly defined. Rickets is a product of defective nutrition. The syphilitic cachexia is a cause of defective nutrition, hence may be an indirect cause of Rickets. But the recent researches of Wegner, Parrot and others, on syphilitic disease of bones, have discovered the close similarity of the morbid changes in the bones of syphilitic infants with those of rickety bones; consequently, a more intimate relationship between the two diatheses may possibly be established at some future time.

Re-infection.—A man who has once had syphilis thereby gains immunity for the future, and further inoculations have no effect upon him. This law, commonly true, is not absolutely so. Instances occur of patients who have had syphilis, and who after a lapse of years again contract the disease, which is followed by incubation, induration at the point of inoculation, enlarged glands, and cutaneous

[1] Fagge: Path. Trans. 1876, p. 333.

eruptions. Such instances are rare; indeed some authors, Sigmund[1] among others, doubt the occurrence of re-infection. It is true that many of the cases brought forward as examples of this kind are simply relapses of the old disease, but there is a sufficient number of satisfactory cases on record to place the occurrence of a second attack beyond question.

Hutchinson narrates a case[2] remarkable for the short interval elapsing between the two attacks. A young surgeon, attacked in 1860, suffered from syphilis severely for two years, and was treated by Hutchinson with mercury copiously. In 1865 he again contracted a sore, which indurated and was followed by a distinct roseolous rash and erythema on the tonsils; another fact also of note is, that this patient had two attacks of small-pox within a period of four years.

In another example of syphilitic re-infection which came under Hutchinson's observation,[3] it is stated that the patient had three attacks, the first fourteen years and the second nine years before the third infection took place.

Follin[4] recites two cases. In one, twenty-one years, in the other, three years elapsed between the two attacks.

Rodet[5] relates, among others, two undoubted instances; in these, eight and four years respectively were the intervals between the two attacks.

Bouley,[6] who is also quoted by Vidal, successfully inoculated syphilis in a woman suffering from what was believed to be severe tertiary syphilis, with the intention of syphilising her in the sense of the term in which it is employed by Auzias Turenne, Boeck, Sperino, and others; but instead of exciting a suppurating contagious ulcer, the constitutional disease was produced.

Dr. Hardie,[7] Surgeon to the 73rd Regiment, in his evidence before the Venereal Committee, described the case of a surgeon who, eleven years after recovering from his first attack, consisting of indurated ulcer, enlarged glands, and rash on the skin, with other syphilitic affections, inoculated himself a second time at a wound on the finger, and thereupon underwent a complete repetition of the disease.

Boeck,[8] in his vast experience, saw only one case of second infection. In this instance, the patient was treated for syphilis when one year old, recovered, and at eighteen years of age contracted a venereal sore, which was followed by constitutional symptoms.

Caspary[9] has recorded three cases where the evidence of re-infection is particularly strong. In the first case, a man underwent, in 1867, a prolonged course of treatment at Aix-la-Chapelle, after suffering from syphilis for several years, and among other affections from severe iritis. He remained free from signs of syphilis from 1867 to 1869, when Caspary detected a hard sore and enlarged inguinal glands. Soon afterwards, general adenitis and a macular syphilide appeared.

[1] Sigmund: Neuere Behandlungsweisen der Syphilis. Wien, 1880.
[2] Hutchinson: Reynolds' System of Medicine, vol. i., p. 293.
[3] *Lancet*, 1874, vol. i., p. 157.
[4] Follin: Pathologie Externe, vol. i., p. 740.
[5] Rodet: Union Médicale. 1857.
[6] Bouley: Annales des Maladies de la Peau, et de la Syphilis. 1851, Nov. 2; and Vidal: Maladies Vénériennes, p. 275.
[7] Minutes of Evidence of Venereal Committee of the Admiralty, 1864 and 1865. (QQ. 1833—1849.)
[8] Boeck: Andersoegelser Angaaende Syphilis. Christiania, 1875.
[9] Caspary: Deutsche Medizinische Wochenschrift. 1875. No. 7.

In the second case a man, aged forty, contracted, thirteen years before his re-infection, a hard sore which was followed by an eruption on the skin, ulcers of the fauces, and mucous patches of the anus. After two courses of inunction he remained free from syphilis, married, and became the father of healthy children. In 1875 the patient exposed himself to contagion, and shortly afterwards consulted Caspary for an induration, papular eruption, enlarged glands, and erosions of the tonsils, which symptoms were dispelled by fifteen inunctions.

The third case is that of a man who consulted Caspary in 1871, having at that time a hard sore, glandular enlargement, and a maculo-papular eruption. These affections disappeared under inunction and sweating. In August, 1875, the patient again came under observation, with a hard sore, enlarged glands, a maculo-papular eruption, and erosions on the soft palate. He stated that he had had intercourse at the end of May, 1875, after which an ulcer appeared. In July he suffered from pain in his joints, and on August 3rd the eruption showed itself.

There is little known respecting the acquisition of syphilis in after-life by those who have inherited the disease from their parents. But there are a few cases recorded which establish this second infection as a possibility, while the rarity of its occurrence suggests that in most persons the inherited contagion protects them from further infection through life. Hutchinson[1] reports a case in which the evidence is strong that the patient had suffered mildly from inherited syphilis, and yet at the age of twenty she undoubtedly contracted the disease in the usual way.

Merckel,[2] observed an instance of the same kind. A girl of eighteen came under his care with ulcers of the vulva, general adenitis, and general maculo-papular eruption, which appeared a few months after marriage with a man suffering from early syphilitic affections. She had lost both hard and soft palate during childhood from inherited syphilis.

In the second mode in which syphilis is said to be repeated, the course is much modified. According to Diday,[3] the earlier stages of the disease do not appear, but the disease advances at once to the later forms, and nodes, rheumatic pains, affections of the liver and other viscera, are the first signs of this second infection.

An instance which came under my own observation will illustrate this mode of repetition of the disease.—A surgeon in 1854 had indurated chancre, enlarged glands, and cutaneous eruptions; he was treated with mercury, and after a time recovered. He then entered the army, and underwent much privation and exposure in foreign service. During this time, and for three subsequent winters, he was frequently subject to rheumatic pains, which were always relieved by iodide of potassium. He regained his health, married, and became the father of two healthy children; a third died of tubercular phthisis.

[1] Hutchinson: London Hospital Reports, vol. ii., p. 164. 1865.

[2] Merckel: Baierisches ärztliches Intelligenzblatt. 1869, No. 22; also quoted by Köbner, in an article on Syphilitic re-infection in the Berliner Klinischer Wochenschrift. 1872, Nov. 11.

[3] Diday: Archives Générales de Médecine. 1862, Juillet, Août.

Eleven years after his first attack, in handling a suppurating sore of a syphilitic patient, he inoculated a scratch on his left fore-finger. Irritation at once ensued, followed by slow suppuration at the tip and in the nail-matrix, with violent pain and throbbing, especially severe at night. The axillary glands were swollen and tender for a short time only. After several months of this painful suppuration, the inflammation subsided, and the finger resumed its ordinary appearance. The patient's strength then failed, emaciation and loss of appetite began, together with violent throbbing pain in the loins, which, like the first pain, was worse at night, and usually confined to one spot. The suffering was relieved at first by iodide of potassium; but after a time this lost its effect. Subsequently he had slight enlargement of the liver, considerable enlargement of the spleen, attacks of jaundice, copious lithates and bile in the urine. The pain occasionally shifted from one point to another. During this time most varied treatment was tried in vain until mercury was given; immediately after the gums had become tender, the pain departed, the jaundice subsided, the urine became natural, and the patient soon regained his weight and strength. The mercury was omitted after taking it for six weeks; in a few days the pain returned and the appetite was lost. Resumption of mercury quickly restored him to his former condition, and the drug was continued for some months longer, to be again laid aside, and again resumed to ward off the aching pain, dyspepsia, jaundice, and debility, which returned if mercury was long withheld.—B. H.

The relief afforded by specific remedies is strong evidence that this disease was due to syphilis. If it be granted that the case was a repetition, and not a relapse of syphilis, it proves that the action of the poison in a second attack may be modified in its course by a previous one. The ordinary symptoms were certainly absent in this case; frequent examination did not discover any cutaneous eruption, sore throat, or enlargement of the glands. The point of inoculation was never an indurated ulcer, nor did the disease extend beyond the symptoms described. The points in favour of its being a second inoculation are—First, the interval of six years' freedom from all syphilitic symptoms. Second, and more important, the indolent painful sore of the fore-finger.

Gascoyen[1] has related the particulars of eleven cases of re-infection observed by himself, of which he had treated seven on both occasions; in three more the former syphilis was guaranteed by competent medical men; and in the last the evidence of the previous attack rested on the patient's own statement. In four of the eleven cases, the only proof of re-infection was an indurated sore; but in six there were constitutional manifestations. One of these six had had two separate attacks of syphilis previously. In the remaining case, where there had been no general eruption during the first infection, indurated sores and hard deposits about the lymphatics of the penis were followed by gummata and tertiary ulcers of the leg without any intermediate symptoms. The interval

[1] G. G. Gascoyen: Medico-Chirurgical Trans., 1875, p. 7. For further examples of re-infection, see the following:—Delestre: Presse Médicale Belge, viii., 1860; Coulson: A Treatise on Syphilis, 1869, p. 138; H. Lee: Lectures on Syphilis, 1875, p. 60; Baümler: v. Ziemssen's Cyclopædia of the Practice of Medicine. English Edition, 1875, vol. iii., p. 70; R. W. Taylor: Archives of Dermatology, January, 1877, p. 118; Rizet: Recueil de Mémoires de Méd. de Chir. et de Pharmacie Militaires. 1879, Nov., Dec., p. 602, &c.

which occurred between the two infections in these cases varied from one year and nine months to more than nine years, and the severity of the second attack bore no relation whatever to that of the first, nor to the length of time that had elapsed since the previous disease. In the case of the three separate infections, the interval between the first and second was about two years, and between the second and third, two years and a half.

Duration.—The length of the period during which the syphilitic poison may be kindled into activity, and consequently capable of transmission by contagion or to the offspring, is not accurately known. The question of transmission to the offspring will be more particularly discussed in the next chapter. The length of time during which the disease may be communicated to others varies greatly: for this reason different lengths are assigned by different authorities. Hutchinson[1] believes that capability of transmission to others ceases in most cases when the generally and symmetrically disposed rashes disappear; that is, during the course of two years after infection. Ricord says six months should elapse after a complete mercurial course has terminated, and during this six months no relapse must occur. By a complete mercurial course, he implies twelve months of continuous treatment. Thus we may infer that Ricord requires at the least eighteen months for the usual duration of syphilis. Bärensprung, who did not employ mercury, says three months' freedom from symptoms must intervene before the disease may be said to have even probably ended. This interval is certainly far too short a one for an average estimate, though it possibly suffices in exceptional cases. Zeissl[2] speaks with little exactness on this point: he thinks that the disease does not endure more than three or four months in a small number of patients; but that in the majority of cases it lasts two, three, or more years. In the army and navy,[3] where better opportunity exists for continuous observation of the same individual than in civil practice, it is stated the men are frequently under treatment for eighteen months or two years.

In the second half-year of 1867 I noted the duration of the disease in 104 female out-patients at the Lock Hospital. In forty-one it was under one year, though of course, as the disease was still in progress, these cannot be given as instances of the exact duration of the disease.

In 63	it exceeded	1 year.
49	„	2 years.
31	„	3 „
23	„	4 „

[1] Hutchinson: Discussion on Syphilis, Path. Trans. 1876.
[2] Zeissl: Lehrbuch der Syphilis, IIter Theil, 1872. S. 82.
[3] Evidence before the Venereal Committee of the Admiralty, 1865. (QQ. 1543, 2037.)

In 19	it exceeded	5	years.
13	„	6	„
12	„	7	„
9	„	8	„
8	„	9	„
6	„	10	„
3	„	11	„

One woman had been subject to relapses during twenty-six years.

The history of seventy private patients, who have been treated throughout by myself, and whose cases are entered in my early note-books, show that the duration is much longer than is generally estimated. Of the seventy cases, twenty-nine are marked cured, as they have had no symptoms while kept under observation for several years. In seventeen cases symptoms ceased in two years; in seven others in four years or less; of those whose disease had lasted more than four years, only five are marked as cured. Forty-one are set down as 'not cured,' because symptoms were present when the patients were last seen, though probably many of the cases have since recovered. Of the forty-one cases '*not cured*,' eight had been infected not more than two years: twelve others had suffered between two and four years. Fourteen more had suffered between four and eight years; while the remaining eight had suffered more or less continuously for periods ranging between nine years and twenty years.—B. H.

Fournier[1] narrates an instance of the tertiary period enduring for fifty-five years after infection.

From the foregoing statistics it would seem that cases of syphilis may be roughly divided into curable and incurable. The curable get well in two years after their infection, but the incurable run on an indefinite number of years, a considerable proportion of them having their disease relieved rather than permanently cured by treatment.

If we combine the opinions of others with our own experience, it may be safely asserted that, as a practical rule, *two years* should be taken to be the period during which a person may expect return of the eruptions on the cutaneous or mucous surfaces. It must, nevertheless, be borne in mind that the longer the disease lasts the more difficult it is to cure; especially in those cases where there seems to be little natural progress towards extinction of the virus. The period at which tertiary affections shew themselves, when they appear at all, is usually about five years after infection.

Mortality.—Precise information on this head is not at present attainable, owing to the incomplete nature of the returns on which statistics are founded. This incompleteness arises from two causes: first, from the fact that only a portion of the fatal changes set in action by syphilis is recognised during life, and consequently, in the absence of *post-mortem* examination, a considerable number of deaths really due to syphilis cannot be certified to be caused by that disease. Secondly, there is great probability, nay certainty,

[1] Fournier: La France Médicale, 1874, Mai 23, et Juin 3.

that many deaths—especially those of children—manifestly caused by syphilis, are certified as deaths from 'marasmus,' 'tabes,' 'malnutrition' and the like. Nevertheless, the returns of the Registrar-General are the only ones available, and are correct so far as they furnish information.

These returns show that the number of deaths ascribed to syphilis in England and Wales is increasing. Farr[1] states that the deaths from syphilis in the years 1875–6–7, were at the rate of 90, 89, and 86 per million of the population. He also remarks that the amount of mortality assigned to syphilis was twice as great in the five years 1870-74, as it was in the five years 1850–4. In a large majority of the fatal cases the subjects are infants. Thus, of 2085 deaths ascribed to syphilis during 1877 in England and Wales, 1551 were those of children under one year of age.

[1] Farr: Fortieth Report of the Registrar-General (abstracts of 1877), 1879, p. 225.

SYPHILIS.

CHAPTER II.

CONTAGION.

Predisposing Causes, or conditions that facilitate the spread, or increase the severity of the disease.

Climate.—Cold climates render syphilis more severe by lowering the vital energy of the patient, and promote its spread by encouraging dirty habits and promiscuous herding together. In hot climates Europeans suffer more severely than at home; but, though the evidence is somewhat contradictory, it would seem that natives of such climates are not more gravely affected than persons who dwell in temperate regions. In central Europe the course of the disease is apparently little influenced by changes of temperature.

According to Lancereaux,[1] sudden changes of temperature and moisture of the atmosphere may exercise an unfavourable influence on syphilis. Diday[2] also noticed that his syphilitic patients suffered severely during the unusually wet and cold autumn and winter of 1879.

Influence of Race.—Syphilis afflicts all races of mankind, but it is reported to be usually less severe among the dark than the light races. According to Dr. Kirk,[3] H.B.M.'s Consul at Zanzibar, syphilis is extremely prevalent along that seaboard. While the negroes and Arabs are but lightly affected, the Portuguese and others of European blood suffer most severely from the graver forms of the disease.

Whenever syphilis attacks a new race or a new district, it spreads rapidly and becomes most severe, approaching the form of an epidemic. Thus, when conveyed to the islands of the South

[1] Lancereaux: Traité de la Syphilis. 1873, p. 465.
[2] Diday: Annales de Dermatologie et de Syphiligraphie. 1880, Jan., p. 44.
[3] Oral communication. See also on this subject, H. Rey: "Syphilis suivant les Races et les Climats." Annales de Derm. et de Syph. 1880. October.

Pacific Ocean by Captain Cook's exploring ships, it destroyed large numbers of the population. This virulence does not continue to be a permanent character, for Mr. Sloggett [1] who, when surgeon to the Calypso, visited those islands in 1858, found that the disease had assumed the form it takes in northern climates.

Age.—Syphilis, though met with at all periods of life, is most common in persons between eighteen and twenty-five years of age; it is also very frequent during the first year of life, when it causes many deaths. When contracted after middle age, syphilis is very slow in its course and liable to oft-repeated relapses. Langston Parker was of opinion that when infection took place after forty years of age, the patient was never cured. Dulac [2] has collected a number of instances of persons who caught syphilis late in life, with the object of showing the severity of the disease in such cases.

The Condition of the Individual generally determines in great measure the gravity of the disease. Still, persons of robust frame and apparently sound constitution may suffer from syphilis in its severest forms. Some idiosyncrasy, the nature of which we do not yet understand, seems in such cases to influence the course of the disease; for different members of the same family, of equally sound constitution and under apparently similar conditions of life, may suffer in varying degree from the slightest to the most severe forms of syphilis.

Starvation, dirt, and overcrowding favour the spread and increase the severity of syphilis. As a proof of this we need only refer to the wonderful improvement in the condition of the prostitutes in certain dockyard and garrison towns since the passing of the "Contagious Diseases Acts." Before these Acts came into operation cases of syphilis of a severe and mutilating form were common among the dirty and half-starved women; but since they have been subjected to supervision and examination, whereby their numbers have vastly diminished and their destitution has been relieved, the graver forms of disease have been rarely seen.[3]

Pregnancy is well known to render syphilis intractable; the initial sore in pregnant women is very slow to heal and is little amenable to treatment. Moret [4] states that the evolution of syphilis is accelerated and the usual order of eruptions modified. The enlargement of the distant lymphatic glands is much slower and less general than in ordinary patients. Again, the eruptions on the skin are limited rather than general, while the affections of the

[1] Evidence before the Venereal Committee of the Admiralty, 1865. (Q. 1515.)
[2] Dulac: Etude sur la Syphilis contractée à un age avancé. 1878.
[3] Evidence taken by the Royal Commission on the Contagious Diseases Acts. 1870.
[4] Moret: Des Manifestations syphilitiques chez la femme enceinte, &c. Gazette des Hôpitaux, 1875, Sept. 24.

mucous membranes are slight; fall of the hair is rare, and syphilitic pyrexia very rare indeed.[1]

Lastly, intemperate habits and alcoholic excess greatly aggravate the disease in all persons and in all climates.

The condition of the source whence a syphilitic person derives his infection, whether from a freely ulcerating or simply eroded primary sore, or from a mucous patch or other secondary lesion, has probably no influence on the course of the disease in him: the gravest forms of syphilis may appear in a patient who received his taint from another suffering from the mildest form of syphilis. The opposite also obtains. Diday[2] is of opinion that those who contract syphilis from a child with the inherited form of disease generally suffer more severely than others.

Individual Liability to Contagion.—Persons vary in aptness for contagion. Probably there are many who escape syphilis, as they escape scarlet fever or measles, from want of susceptibility. On the other hand, some few persons show excessive proneness to infection and suffer more than once from the same contagious disorder.

Principle Essential for Communication.—The virus of syphilis is a subtle matter of unknown constitution. It is not volatile, hence the disease is never spread by atmospheric infection. The poison, when introduced into the system of persons not previously subjected to its influence, multiplies indefinitely and pervades all the tissues of the body.

More than once pathologists have attempted to point out the essential vehicle or cell peculiar to syphilis; some maintain that the red corpuscle alone of the constituents of the blood contains the virus. In 1872 Lostorfer described certain cellular bodies which he found in the blood of syphilitic persons, when the specimens were preserved a few days in a moist atmosphere at an ordinary temperature. He termed them syphilitic corpuscles. Stricker of Vienna, and Köbner of Breslau, however, procured these peculiar bodies from the blood of persons not affected with syphilis.[3]

Modes of contagion.—Syphilis may be propagated by:—

1. *Direct contact.*
2. *Mediate communication.*
3. *Hereditary transmission.*

Except in the case of Inheritance, the poison enters the body through a breach of surface. Prolonged contact of the vitiated

[1] Sigmund: Ueber den Verlauf der Syphilis bei Schwangerschaft. Wiener Med. Presse, 1873. No. 1.

[2] Diday: Thérapeutique des Mal. Vén. 1876, p. 337.

[3] Archiv für Derm. u. Syph. 1872. Lostorfer: S. 115. Stricker: S. 274; and Köbner: S. 293.

secretion with an unbroken epithelium may possibly suffice for absorption of the virus; but this, if it ever happen, must be a very rare occurrence.[1] Be this as it may, the first effects of syphilitic contagion are nearly always discovered in situations where the mucous membrane or skin is most liable to be chafed or torn. The following case which bears strikingly on this point, may be quoted from Ricord.[2]

A man with a syphilitic sore on his penis had repeated intercourse *per vaginam*, and also *per anum*, with a healthy female. On examination of the woman Ricord found the initial lesion of syphilis, not on the genital organs where the easily-yielding structures offered little resistance, but at the anus where the closely contracting sphincter caused an abrasion of the mucous membrane to be readily produced.

Syphilis is most commonly communicated during *coitus*, because delicate and easily abraded surfaces of different individuals are then brought into most intimate relation. It must be remembered, however, that the disease, although most frequently venereal, is by no means necessarily so; and that modes of contagion having nothing whatever to do with sexual intercourse are not at all rare: for example, by examining diseased persons, especially parturient women, by kissing, and by suckling; also indirectly by the use of unclean instruments, drinking vessels, spoons, pipes, and other articles. Syphilis has also been conveyed by the operation of vaccination.

Examples of the propagation of syphilis to medical men and midwives whilst attending diseased women in labour are unfortunately far from infrequent. The disastrous results that may ensue through the infected attendant under these circumstances are well shown in a communication made by Bardinet[3] of Limoges to the Academy of Medicine of Paris.

A midwife inoculated the middle finger of her right hand, and had secondary symptoms in due course. The woman continued her profession. The consequences were, that the majority of her patients became syphilitic, as well as her own husband, and the husbands and infants of several of those she had attended. It was computed that syphilis thus spread to over a hundred persons: four of the children died.

Among the numerous instances of nurses being infected by their foster-children, one reported by Barillier[4] is very striking:

A healthy wet-nurse, engaged at a nursery, suckled an apparently healthy child whose mother had been certified to be free from disease. When the child

[1] The necessity or non-necessity for a breach of surface will be more fully considered in the chapter on Chancre.
[2] Ricord: Lettres sur la Syphilis, 3me ed. 1863, p. 182.
[3] Bardinet: Bulletin de l'Académie de Méd. 1874, p. 110.
[4] Barillier: Gazette des Hôpitaux. 1860, No. 65.

was twenty-five days old, thrush appeared in the mouth and syphilitic ecthyma on the body, and it afterwards died. The nurse's nipples were made sore by the child's mouth; ulcerating papules formed on the areolæ, and syphilitic eruptions followed. Meanwhile, a second child had been suckled by the wet-nurse along with the first for a few days. Eighty-five days later this second child was brought back with a papular eruption, ulcerated throat, and other symptoms of which it died. A country wet-nurse, who had received the second child, also contracted syphilis through the nipples. Lastly, a third child who had been suckled by the first nurse, caught syphilis from her and died. On examining the first child, Barillier found it covered with a pustular eruption, and *post-mortem*, the liver and other organs were discovered to be very extensively diseased. When he examined the mother of the first child he found that she also was syphilitic, and that she had been so before the birth of her infant.

Dron [1] gives an account of seventeen cases in which nurses were infected on the breast by syphilitic infants; and in two of these cases the nurses afterwards infected healthy children. Fournier [2] relates the following case:

A syphilitic wet-nurse infected the child given to her to nurse. The infant, whose disease was at first overlooked, infected in turn its mother and its grandmother, besides two healthy female servants of the house; finally, the father of the child became infected through his wife.

Johnson [3] reports the case of a man with a syphilitic sore in his mouth who gave syphilis to the woman he intended to marry by sucking her breast. Rollet [4] of Lyons also has collected examples of a similar kind. In one case a man received the disease through a bite on the nose. In two cases ladies were inoculated on the lips by the kisses of their lovers.

Mediate communication.—The foregoing are all examples of the *direct* mode of contagion; but instances of *indirect* or *mediate* communication are not uncommonly met with. Rollet [5] narrates the case of a lady who contracted syphilis on the lip by tasting soup with the spoon used by her cook who had syphilitic sores in the mouth. The same author refers to several cases of glassblowers having been contaminated by the mouth through passing the tube used in inflating globes of glass from one blower to another.[6] More recently an epidemic of syphilis from the same cause has been enquired into by M. Dechaux [7] at Montluçon: syphilis was conveyed through the medium of the inflating tube to eleven workmen, from

[1] Dron: Annales de Dermatologie et de Syphiligraphie. 1870, p. 161.
[2] Fournier: Nourrices et Nourrissons Syphilitiques. Paris, 1878, p. 57. For similar examples, see also Lagneau: Annales d'Hygiène, 1875, p. 161; Caspary: Berlin Klin. Wochenschrift, 1875, No. 41; Edelfsen: Berlin Klin. Wochenschrift, 1876, No. 5.
[3] Johnson: British Medical Journal. August 18, 1860.
[4] Rollet: Archives Gén. de Méd., vol. xiii., 1859. See also Tardieu: Annales d'Hygiène et de Méd. Légale, 2nd series, vol. xxi., p. 371; and Viennois: Gaz. Hébdom., 1863.
[5] Rollet: Loc. cit., p. 399.
[6] Rollet: Loc. cit., p. 319.
[7] Dechaux: Gazette des Hôpitaux. May 2, 1874.

one who had a syphilitic affection of the nasal fossæ. Five of the wives and several children of these workmen became infected and some of them died.

In the following case, which came under my notice at the Lock Hospital in 1874, contagion appeared to have occurred by means of a towel :

A man was in the habit of rubbing his gums with a towel which was used in common with a companion who had sore throat and spots on the skin. When I saw the patient there was a well-marked indurated sore on the gum, above the left central upper incisor, and the glands beneath the jaw were enlarged. There was also a tuberculous syphilide of the face, trunk, and limbs, together with a sloughy ulcer of the tonsil.—B. H.

Poray-Koschitz [1] gives an instance of three workmen contracting syphilis at the lips by drawing through their mouths and biting off pieces from a ball of thread, which they used in common with a fourth fellow-workman who had general syphilis. Similar again is the case of a healthy woman who caught syphilis by sucking the mouthpiece of a feeding-bottle used by her grandchild which was suffering from the inherited form of disease.[2] Dr. L. D. Bulkley[3] of New York has recorded two carefully observed cases in which syphilis was probably contracted through cigars, from the maker licking down the end of the outside investing leaf while suffering from syphilitic sores of the mouth.

Ricord[4] has pointed out the danger of spreading syphilis among Jewish infants by the mode of treating the wounds left after *circumcision*. Tardieu[5] also says that this operation has been the means of communicating syphilis. R. W. Taylor,[6] however, is of opinion that there is no satisfactory case of the kind on record, and remarks that Ricord himself afterwards doubted his own conclusion in a case reported by him as an example of this mode of contagion. Of four cases alleged to be of this kind and enquired into by Dr. Taylor by order of the New York Board of Health, only one child was proved to have syphilis at all, and in that instance there was no reason for attributing contagion to the operation. Kaposi[7] gives drawings showing ulcers of the penis in two Jewish infants which he describes as chancres following the rite of circumcision. But as the patients were four months old at the time, and as no details of general syphilis are given, the evidence is insufficient to warrant their being considered as instances of the propagation of syphilis

[1] Poray-Koschitz : Centralblatt für Chirurgie. 1875, No. 41, p. 653.
[2] Macdonald : Edinburgh Medical Journal. July, 1873.
[3] Bulkley : Archives of Dermatology. October, 1879, p. 343.
[4] Ricord : Lettres sur la Syphilis. 3me éd., p. 192.
[5] Tardieu : "Maladies produites accidentellement," &c. 1879, p. 264.
[6] R. W. Taylor : New York Medical Journal. December, 1873.
[7] Kaposi : Syphilis der Haut, &c., 1874. I Lief. Tafel V., figs. 2 and 3.

by circumcision; it would appear, therefore, that up to the present time there is no authentic case on record of syphilis having been propagated during the rite of circumcision.

It is well known that uncleansed Eustachian catheters[1] and other instruments have occasionally conveyed the disease. The spread of syphilis in Finland by *cupping* has been already noticed. A striking example of wholesale propagation of syphilis by *tattooing* occurred in the United States, when a professional tattooer inoculated fourteen persons with syphilis through moistening his instruments in his mouth which was the seat of mucous patches.[2] A similar instance of communication of syphilis is reported by Robert:[3] eight soldiers were tattooed by a man who was found to be suffering from mucous patches in the mouth, and who used his saliva freely during the operation. That three of the men contracted syphilis was shown by the appearance of the initial lesion at the site of the tattooing, followed by enlarged glands, and general eruption. Five escaped; but one of the five had already suffered from that disease. Després[4] has observed two cases in which syphilitic inoculation on the chin was supposed to have occurred during the operation of *shaving* by a barber.

The communication of disease from one person to a third, through a second who escapes, will be noticed in the chapter on Chancre.

Vaccination has long been accused of conveying syphilis. Moseley[5] is claimed as one of those who noted this danger; but that author, writing a diatribe against the practice of vaccination which he contemned as likely to introduce into the unlucky patients maladies of various kinds, does not include syphilis among them.

The possibility of such a mode of contagion was generally scouted in this country until recently, and this not for want of attention having been directed to the question through the agency of the Government; for in the year 1857, the then Medical Officer of the Privy Council, Mr. John Simon,[6] collected answers to a series of

[1] Ed. Fournié (L'Union Médicale, 1862, p. 583) mentions five cases, of one of which he relates full particulars, and gives Ricord's authority for the rest, where syphilis was conveyed by catheterism of the Eustachian tube; the operator being a notorious quack. See also Alfred Fournier: Syphilis chez la Femme. Paris, 1873, p. 55.

[2] Maury and Dulles: American Journal of the Med. Sciences. Jan. 7, 1878, p. 44.

[3] Robert: Annales de Dermatologie et de Syphiligraphie, 1879, Nos. 5 and 6, p. 417. See also:—S. Jones: Syphilis following a bite on the hand. Brit. Med. Jour., March 23, 1872; Hutchinson: Syphilis by striking a finger against the tooth of a diseased person. Brit. Med. Journ., January 6, 1872; Hardy: Syphilis acquired by means of a lozenge, quoted by Murray, Brit. Med. Jour., November 30, 1872; Munro: Syphilis propagated through a cornet-à-piston. Brit. Med. Jour., 1875, vol. i., p. 366; Baxter: Syphilitic inoculation by a tooth-brush. Lancet, May 31, 1879; Otis: Initial lesion on the lip acquired through a kiss; Syphilis acquired by means of a pipe; Initial lesion in the mouth following a dental operation; Syphilis supposed to have been contracted through the medium of a lead pencil. Class-room lessons on Syphilis, 2nd ed., Nov., 1878, p. 16, and Clinical Lectures on Syphilis, &c., 1881, p. 102.

[4] Després: Journal des Connaissances Médicales. 1880, No. 49.

[5] Moseley: A Treatise on the Lues Bovilla or Cowpox. London, 1805.

[6] Simon: Preface to papers relating to the history and practice of Vaccination. 1857, p. xiii.

questions on the subject of vaccination from a large number of physicians and surgeons of this and other countries. Some of the questions requested information concerning the propagation of syphilis by vaccination. Not one of those interrogated related an instance of such contagion. Bamberger of Würtzburg and Jonathan Hutchinson of London, stated[1] that they had seen syphilis communicated with vaccinia from a true Jennerian vesicle, but they cited no examples. Nearly all the others interrogated knew nothing of this mode of contagion, and many argued on its impossibility. In 1871 Thomas Smith[2] brought before the Clinical Society of London an indisputable example of an adult being infected with syphilis by vaccination; and shortly after him Hutchinson published other cases which are noted further on.

The evidence adduced by these gentlemen directed attention to this matter: so that the opinion is now general in this country, which was previously held by the few who had informed themselves of the facts long before recorded in foreign medical literature, concerning the spread of syphilis by vaccination. Viennois[3] of Lyons collected several instances of vaccinal syphilis and added them to a report of the discussion on that subject in the French Academy of Medicine in 1865. Though many of these cases were only examples of the outbreak of syphilis in children about the time of their vaccination, in some of them syphilis was positively inoculated together with the vaccinia. Lancereaux[4] has brought together nineteen such cases. They include 351 individuals vaccinated from syphilitic children; 258 of them were inoculated with syphilis, and the rest escaped.

A most exactly-narrated example of vaccinal syphilis is that of Sebastian,[5] principal physician of the Maternité at Beziers:—"On 19th March, 1863, a woman, A. M., brought her child to me with a request that I would vaccinate from it two children belonging to friends who came with her. The child was ten months old and had been vaccinated eight days before. I immediately complied with her request, taking my customary precaution not to make the vesicle bleed as I charged my lancet. The vesicles, by the way, were well developed and showed nothing unusual. At the moment of taking lymph to make the last puncture in the *second* child, the vaccinifer made a start, whereat the point of the lancet penetrated deeply, and a drop of blood tinged the lymph, which bloody lymph was, to my great regret, nevertheless inoculated. Twenty-two days later, the child was brought again to me. All the vaccine vesicles had developed without any peculiarity except that one, which I perfectly recollect was the same in which I had inserted the bloody lymph, presented a pustule. This pustule had all the characters of an indurated sore. It had a

[1] Simon's Blue Book, pp. 31—117.
[2] T. Smith: Clinical Transactions, 1871, p. 53.
[3] Viennois: "De la Syphilis Vaccinale." 1865. This work contains a large number of communications from French and Italian physicians on this subject.
[4] Lancereaux: Traité historique et pratique de la Syphilis. 2me édition, 1873, p. 493.
[5] Sebastian: Gazette des Hôpitaux. 22 October, 1864.

conical crust of a dark and shining aspect. It was two-thirds of an inch in diameter, and the skin around was slightly ulcerated; round about this ulcerated surface for about the distance of half an inch were lentil-shaped papules, smooth, regular, pale red, and very numerous. In the axilla was a lymphatic gland, swollen to the size of a nut, and very tender. Forty-five days later [sixty-seven after the inoculation] I saw the child again. The pustule had ulcerated and was much indurated. The body of the child was covered with a syphilitic roseola, and there were mucous patches on the genitals. The child I first vaccinated showed absolutely nothing. I then carefully examined the child who had furnished the vaccine. It looked thriving, and the vaccine vesicle had healed perfectly. His body showed numerous stains of papular syphilide. The cervical glands were enlarged, and there were mucous patches of the anus and genitals. The father of this child was a soldier who had had a hard sore, and had been treated for thirty-five days at the Tours hospital. He was by no means cured, and had crusts on the scalp, enlarged cervical glands, syphilitic stains, and patches at the anus."

A remarkable outbreak of syphilis by vaccination occurred in 1861, at Rivalta near Acqui in Piedmont. Dr. Pacchiotti[1] of Turin was employed by the Italian Government to report upon the attack, and visited the district on October 7th, 1861, four months after the vaccination which gave rise to the quasi-epidemic. The facts are shortly these :—

On 2nd June, 1861, an apparently healthy child, named Chiabrera, was vaccinated at Rivalta with lymph sent in tubes by the public officer of Acqui for the purpose. Ten days after this vaccination (June 12th), forty-six healthy children were vaccinated at one sitting from this child. Again, on the 22nd of June seventeen other healthy children were vaccinated from one of the forty-six. Thirty-nine of the forty-six received syphilis by this vaccination, and seven of the second series of seventeen, making a total of forty-six out of sixty-three children, inoculated with syphilis, in a mountain village of two thousand inhabitants, within a week or two of each other. Some months elapsed before the vaccination was suspected to be the source of the children's bad health. By the 7th of October, six of the forty-six syphilised children had died without receiving any treatment, fourteen were recovering, and three were in a precarious condition. Twenty-three others were dispersed through the country, and their condition was unknown until further researches traced them out. In addition to the children, twenty women who suckled them were thereby inoculated with syphilis. Through the mothers the disease had reached some of the husbands, and even the elder children of the different families. The first child, Chiabrera, was not infected through the vaccine lymph, because he had the vaccine disease in its regular course, and only the changes proper to vaccination were developed in the vaccine scar. The syphilis did not come from his mother, because the initial manifestation did not appear in her until the 8th of October—some time after the child had been marked with general eruption. This shows she took the disease after her infant. Neither was the child infected by his father, because the latter was quite free from syphilis when the mother contracted it, and continued so during the two years which elapsed after Chiabrera was born. From the evidence collected by Pacchiotti, who thoroughly investigated all the points of this case, it appears that the disease was communi-

[1] Pacchiotti: Sifilide trasmessa per mezzo della Vaccinazione in Rivalta presso Acqui. Turin, 1862.

cated to Chiabrera by a woman named Liberata Pavone, known to be syphilitic, at whose breast he had sucked a few times, two or three months before he was vaccinated. A niece of Pavone's, who had also sucked at her aunt's breast, became syphilitic and infected her own mother. The other children, without exception, showed by the form and course of the disease, that their inoculation had taken place at the site of the vaccination.

Many other instances of the communication of syphilis by vaccination have been recorded. In this country Hutchinson[1] has published an account of six series of cases which came under his notice. The first series consists of twelve persons vaccinated, of whom two altogether escaped, while induration occurred at one or more of the vaccination punctures in ten, and constitutional symptoms in four. The second series comprises twenty-six vaccinations: of these persons nine contracted syphilis, six more had suspicious symptoms, and eleven altogether escaped. The third series consists of one known case of syphilis; the history of twelve others vaccinated from the same vaccinifer could not be traced. In the fourth series, one person contracted syphilis while several escaped. The fifth series contains two cases, and the sixth one case.

To vaccination another influence has been attributed. If syphilis be latent in a child, the vaccinal fever, like any other febrile disturbance, may rouse it into activity. Many cases of infantile syphilis have thus been recorded as originating in vaccination, while really only somewhat hastened in development thereby. In investigating cases of suspected vaccinal syphilis, it must be borne in mind that syphilis is never inoculated without producing the following phenomena. First, a period of incubation; second, the appearance of the initial lesion at the site of one or more of the vaccination punctures; and thirdly, slow multiple enlargement of the neighbouring group of lymphatic glands; subsequent to these appears the general eruption on the skin.

Coste[2] has narrated two cases that came under his observation, where vaccination in syphilitic children caused ulcers at the point of vaccination which, from their cause and appearance, might well have been mistaken for the initial lesion of syphilis. Further, while some of the vaccinal punctures produced these pseudo-primary ulcers, other punctures made on the same child at the same sitting, produced vesicles which ran through the usual course of vaccinia and left the usual foveated scar. One of these children was vaccinated by Coste in the presence of his colleague with the intention of watching the course of vaccination in a syphilitic child. Care was taken that the lymph employed in this experiment should be taken from a vaccinifer free of syphilitic taint. One of the vesicles thus produced in the syphilitic child was so thoroughly typical of vaccinia that it was employed by Coste to vaccinate three healthy children, in none of whom did any affection but those proper to vaccinia appear. Still more; unknown to

[1] Hutchinson: Medico-Chirurgical Transactions. 1871 and 1873; and Illustrations of Clinical Surgery, Fasciculus vi. 1877.

[2] Coste: Gazette des Hôpitaux. 1873, Dec. 11 et 16.

Coste, the ulcerating papule which had formed at one of the punctures was used as the source of lymph to vaccinate a fourth child. This child had a marked course of syphilis from the unfortunate blunder of the vaccinator. It is to be regretted that Coste, while stating that this infected child's parents were quite free of syphilis, omitted to state that the initial lesion of syphilis developed at the site of these spurious vaccination punctures. There can, however, be little doubt that this was the case.

The foregoing does much to explain the reason why, when a number of individuals are vaccinated with lymph taken from a syphilitic person, some escape and others are infected. It would seem highly probable that the well-formed vaccine vesicle does not contain in its lymph the syphilitic poison, and that to give it that virus, it must be mixed with some of the other fluids of the syphilitic vaccinifer, most especially with his blood. Sebastian's case is very instructive on this point. He was quite positive that the sole puncture known to have been contaminated by the syphilitic vaccinifer's blood was also the only one where a syphilitic primary lesion formed. In the Rivalta series, and in those of Hutchinson, blood was also known to have been inserted with the vaccine lymph into some of the children who contracted syphilis.

In relation to this is Diday's[1] experiment: he inoculated on a healthy young lady the puriform contents of a pustule of iodic acne from a person who was in the full outbreak of secondary eruption. No mischievous result followed.

Von Rinecker[2] disputes the theory that the blood is the vehicle of the contagion, and considers that if the blood were the cause, the inoculation of syphilis during vaccination ought to be a very frequent occurrence instead of, as is actually the case, a very rare one. He thinks the true reason of this rarity is that the syphilitic virus is not, as a rule, contagious so soon as eight or ten days after it has been inoculated (the usual time for taking vaccine lymph). This explanation of course only applies to healthy children inoculated with syphilis at the time of vaccination, and does not explain the frequent absence of contagion when vaccine lymph is taken from children born syphilitic.

Koebner, again, holds that aroused syphilis may appear as a general exanthem or as a lesion at the site of vaccination. The following case, recorded by Tarnowsky,[3] to some extent corroborates this view:—

A. K., the child of a woman who had been treated for early syphilis during pregnancy, was born 21 March, 1876, at term, well nourished and apparently

[1] Diday: Gazette Médicale de Lyon. 1865, Fevrier, p. 47. Quoted by Lancereaux, loc. cit., p. 473.
[2] v. Rinecker: Viertelj. f. Derm. u. Syph. 1878, S. 259.
[3] Tarnowsky: "Reizung und Syphilis." Ibid., 1877.

healthy; but on 8 May, 1876, a papular exanthem appeared which was dissipated by subcutaneous injections of mercury. In December, 1876, a papulo-squamous syphilide. On 11 April, 1877, the child was vaccinated, by crucial incision, with lymph from the arm of a re-vaccinated young doctor who had never had syphilis. The course of the vaccinia in the child was normal throughout its early stages. On May 3 the crust fell off and exposed a deep cup-shaped sore which discharged a sero-purulent fluid. The borders and base of the sore were 'exquisitely' hard. Water dressing was applied, and the sore disappeared by May 18, leaving the axillary glands hard. Meanwhile mucous patches appeared on the tongue, and the cervical glands enlarged. Vaccination was repeated, but had no effect.

In France and Italy, as well as in some other continental countries, much vaccination is performed by midwives and herbalists as well as by qualified surgeons. This practice probably explains the frequency of the spread of syphilis by vaccination in those countries, while such a calamity has been almost unknown in the United Kingdom, where the operation is entrusted solely to legally qualified medical men.

In support of the evidence that there is no antagonism between the virus of syphilis and vaccinia, and that neither of them is impeded in its development by the admixture of the virus or exciting principle of other diseases, the experiments of Sperino and Baumés[1] with the virus of another contagious disorder, viz., the local chancre, are worthy of note. These observers produced both soft inoculable ulcers and vaccinia by inoculating a mixture of chancrous pus and vaccine lymph.

From an analysis of the various instances of contagion by vaccination the following conclusions are reached:—(a) That syphilis may undoubtedly be propagated by vaccination; this is abundantly proved by the evidence already related. (b) That persons vaccinated from a syphilitic vaccinifer do not necessarily contract syphilis. This has been proved many times, and is well illustrated by the cases of the St. Petersburg Foundling Asylum.[2] In that institution during the years 1865—67, fifty-seven healthy children were vaccinated from eleven others who were suffering at the time from hereditary syphilis. None of the fifty-seven children were infected. Again, Aimé Martin[3] relates the history of a family, where father, mother, and children were by mistake vaccinated with lymph taken from the vesicles of a syphilitic child. None of these patients caught syphilis. (c) That of several persons vaccinated from the same syphilitic vaccinifer, some may escape whilst others

[1] Sperino and Baumés: Viennois, La Syphilis Vaccinale, p. 279.
[2] St. Petersburger Mediz. Zeitung. 1872, Bd. I., S. 73.
[3] Aimé-Martin: Discussion dans la Société de Médecine de Paris sur la Syphilis Vaccinale, Gazette des Hôpitaux, 1873, p. 732.

become infected; or one or more of the punctures in the same subject may become the seat of the initial lesion of syphilis while the rest remain healthy. This happened in several of Hutchinson's cases and in that reported by Thomas Smith. (d) That vaccinia and syphilis may be inoculated together, each disease running its own course; or that either inoculation may succeed or fail independently of the other.

The following may be consulted for further information concerning the spread of syphilis by vaccination.

Marcolini—Sulle Complicazioni della Vaccina. Milan, 1823.

Veterinary Surgeon of K—. Wegeler: Berliner Med. Zeitung, April 3, 1850.

Hübner series—Gazette Hebdomadaire, 9 Mars, 1855.

Lupara series—L'Imparziale di Firenze, No. 5. 1862.

Morbihan (Auray) series—Depaul: Bulletin de l'Académie de Médecine, t. xxxii. Nov. 13, 1866, p. 201.

Ballard—On Vaccination: its value and alleged dangers. London, 1868.

Seaton—A Handbook of Vaccination. 1868.

Lanoix—La Tribune Médicale. July 26, 1869.

Anstie—Practitioner. November, 1869, p. 298.

Köbner—Archiv für Dermatologie und Syphilis. 1871, ii Heft.

Eulenberg—Berlin Med. Wochenschrift. Sep. 16, 1872.

Discussion on Vaccinal Syphilis at the Medico-Chirurgical Society. Brit. Med. Journal, 1873.

Report of two cases by M. Béloin, and discussion on Vaccinal Syphilis at the Société de Médecine, Paris. Gazette des Hôpitaux, June 3, 10, 24, July 5, August 9, 23, 1873.

R. W. Taylor: Archives of Dermatology. 1876, p. 203.

Hereditary Transmission.—That syphilis may descend from parents to their offspring has long been well known. This doctrine was promulgated by Gaspar Torella as early as the year 1495. In 1553 Ferrier taught that syphilis might be inherited through the semen, through the ovum, and by imbibition from the mother infected after conception. The inheritance of syphilis was further described by Fallopius in 1564, and by others during the sixteenth and seventeenth centuries; and was more exactly defined by Astruc and Boerhaave in the eighteenth century. John Hunter[1] questioned the correctness of this doctrine of heredity, as it interfered with his well-known dictum that syphilis could be propagated only by primary sores.

Although the reality of the transmission of syphilis by inheritance is now too generally accepted to need further discussion, there are still various opinions concerning the modes by which the disease reaches the child.

The facts which have been observed relative to the hereditary transmission of syphilis, and the conclusions which have been drawn

[1] Hunter: Palmer's edition of his works, vol. ii., p. 383.

from them, may be conveniently divided for consideration into two heads :—

I. Descent from the father.

II. Descent from the mother.

The so-called descent from both parents is not distinguishable from descent from the mother.

Before discussing the evidence concerning the ways in which syphilis is said to reach a child from its father, it will be convenient to enumerate the modes in which a mother may become infected by her husband. Four such modes have been indicated, and are maintained by various authorities with more or less constancy.

The first is universally admitted to be the most frequent one, namely, contagion through a breach of surface, *e.g.*, of the external genitals, mouth, or some other part. In such cases, the usual phenomena appear in due order; incubation, initial lesion, enlargement of lymphatic glands, and general eruption.

Secondly: Owing to the frequent absence, either presumed or real, of the initial manifestation, recourse has been had to other explanations. One is that the spermatic fluid of a syphilitic man has the power of infecting his wife, without producing in her the ordinary initial lesion of syphilis. This ascribed power is again believed to act in a two-fold manner. Some hold that the wife may be infected by the semen, whether or not she become pregnant.

Thirdly: A larger number of observers maintain that the wife of necessity escapes infection unless she conceive; but if that happen, she may herself receive the poison into her own system, simultaneously with the tainting of her ovum. Thus both mother and offspring are directly infected by the father. It is further affirmed that she may escape even when the ovum is reached by the syphilitic virus.

Fourthly: Some, who deny that the semen of a syphilitic man can directly infect the mother of his child, allow that the ovum itself may be attacked, and hold that as the ovum developes, the syphilitic virus also maturates into a condition in which it may and does pass to the mother. This method has received the name of '*choc en retour*,' and is supported by a numerous band of writers. Evidence to support this doctrine, based on the condition of the placenta in syphilitic women, will be discussed presently.

I. *Descent from the father.*—(a) A man recently infected and obviously syphilitic, marries, and infects his wife soon after cohabitation commences. The child, under such circumstances, is nearly always syphilitic.

In cases of this kind, the site of the wife's contagion is usually found with facility. Her disease begins with a hard initial lesion,

and in every way constitutes an ordinary case of contagion by contact. Here, of course, the child's infection is only indirectly from the father.

Again, when a man has apparently passed through his course of syphilis, that disease, after a period of latency, may suddenly assume activity a second time and reveal its presence in some easily recognized form; his wife and child then frequently become syphilitic. In such cases it is reasonable to suppose that the husband's syphilitic secretions have been communicated to his wife either during sexual intercourse, or by kissing, or by some other means of close contact. Consequently here again we have only to deal with instances of ordinary contagion from father to mother, and by inheritance through the mother to the child.

(b) There are some well-authenticated instances which cannot be accounted for as cases of ordinary contagion—cases where both mother and child become syphilitic[1] although the revived activity of the father's syphilis does not betray itself by any symptom in his own person; that is, the disease is *latent* in the father.

Let us take first the assertion that a woman can be imbued with the syphilitic virus where there is no child, by frequent intercourse with a man whose disease is *latent*. For lack of a recognised mode of contagion, the infection is supposed by Parker,[2] Behrend,[3] Knoblauch[4] and others to be caused by the virus of syphilis being conveyed from the male in his semen. Knoblauch, it is true, does not expressly state his adhesion to this opinion, but he is credited with it because he refuses to allow that infection can pass from the fœtus in utero to the mother, consequently, to her spouse alone must the wife's contagion be referred. This mode of contagion is not accepted by many; it rests not on facts, but solely on the positively-expressed opinion of a few well-known authors. We have no belief in this theory, and not a little contradictory to it is the failure of experiments with the inoculation of semen to produce syphilis,

[1] Fürth: Die Pathologie und die Therapie in der hereditäre Syphilis. 1879. Also, Hutchinson: British and Foreign Medico-Chirurgical Review. Oct. 1877, p. 457.

[2] Langston Parker: Evidence before the Committee on Venereal Diseases in the Army and Navy, 1865, Q. 3339. Parker adduced no evidence beyond his personal opinion. In another paper, where evidence is offered (On Latent Syphilis and its effect on healthy females and on the fœtus in utero, Medical Times and Gazette, July 4, 1863, pp. 6, 7, 8), Parker's conclusions are not supported by his cases; for there were "intense vaginal irritation, and hard knotty lumps in the labia" in two cases at the outset of the patient's disease; in the third case an obstinate ulcer of the cervix uteri was found during the period of general syphilis. This ulcer, however, was probably not the initial lesion, for it lasted some years, though Parker assumed it to have been produced by contact with the semen of the syphilitic husband. Likewise, Tyler Smith's cases (On the transmission of Syphilis from the male parent to the fœtus in utero, Lancet, March 11, 1854, p. 267) are, from imperfect reporting, quite untrustworthy; the same objection applies to the cases of Keyfel (Aerzt. Intelligenz-blatt, 1876, No. 21, S. 13), and of many others.

[3] Behrend: Syphilidologie, Neue Reihe. 1860, Bd. II., SS. 249, *et seq.*

[4] Knoblauch: Behrend's Syphilidologie. 1862, Bd. III., S. 576.

which will be mentioned elsewhere. At the same time it is not yet proved beyond dispute that the seminal fluid of a syphilitic man is innocuous.

Let us next take the instances where the child and the wife are infected.

A syphilitic man marries when his disease is latent, and his wife reveals no sign of infection so long as she remains barren. But, should she conceive and her child prove to be syphilitic, the following often happens :

During her pregnancy, the mother suffers, and apparently for the first time, from syphilitic affections of more or less general character, but no initial lesion is discovered on her body. This phenomenon is accounted for in two ways by different observers.

(c) *Infection of mother and ovum during conception.*—This means that the mother is infected at the very moment of conception by the tainted semen of her husband, which thus infects two beings simultaneously—the wife and her offspring. Von Bärensprung,[1] who is most conspicuous among those who hold this opinion, does not adduce conclusive evidence in support of it. But he lays much weight on the important fact that nearly all women in whom the disease manifests itself during pregnancy, even though there be no obvious precursion of the initial lesion and its concomitant local glandular enlargement, first show their disease about the ninth or tenth week after conception ; a length of time that corresponds with the usual interval between contagion and the outbreak of general eruption, and corroborates the belief that the mother's infection has taken place at the time of her conception. Knoblauch,[2] though rejecting the possibility of a mother receiving contagion from her fœtus, believes in double infection. The alleged escape of the mother will be dealt with presently.

(d) *Syphilis following conception, or, "Choc en retour."*—Other writers do not accept the simultaneous or double infection of mother and child by the father, but incline to a different explanation, namely, that the mother becomes infected by the fœtus during gestation. Diday[3] has written at length on this presumed mode of infection, which indeed had been previously suggested by Ricord.[4] Diday[5] has recently published seventeen cases of his own, and nine recorded by other observers where syphilis was judged to have been propagated in this way. In ten of these more or less imperfectly

[1] v. Bärensprung : Die hereditäre Syphilis. 1864, p. 50, *et seq.*
[2] Knoblauch : Loc. cit.
[3] Diday : Infantile Syphilis, Syd. Soc. Translation. 1859, p. 146.
[4] Ricord : Lancet. 1848, vol. i., p. 384 ; and Lettres sur la Syphilis, Nouvelle édition. 1863, p. 544.
[5] Diday : Annales de Dermatologie et de Syphiligraphie ; vol. viii., p. 161.

reported observations, the author of the case stated that he sought for, but did not find, any primary manifestation of syphilis in the mothers; and in no case was a primary sore mentioned in the report. Several of the husbands, however, had mucous papules on the lips or even on the genitals at the time of their wives' conception. The inguinal glands were said to be unaffected in all. In twenty-one patients, the first sign noticed was a skin eruption, which appeared simultaneously on various parts of the body. It is important to note that in Diday's cases as in v. Bärensprung's already mentioned, the period at which the first eruption appeared on the mother in twenty-four cases, averaged sixty-five days after conception; only once did the first signs appear after the fourth month of pregnancy. In eleven cases, the length of time which elapsed between marriage and the pregnancy which was complicated with syphilis, varied between eight months and six years.

Hutchinson many years ago put forward cases [1] to support the doctrine of infection of the mother by the fœtus. But there is a defect in all of them which destroys their value for this argument. It is this; the women were not examined when their malady was recent, but when their symptoms had already existed in many for years, and in all for months. The evidence against their having developed the initial sore and glandular enlargement at the customary time, was merely the patients' statement that they had observed no such affection. Excepting the absence of record of an initial sore, the cases of these women in no way differed from such as have the initial signs in customary form. In those patients who had suffered for two years or less, the symptoms noted were sore throat, papulo-scaly eruptions, mucous papules and fall of the hair—all well-known signs of early syphilis. Other patients, whose disease was of longer standing, had deep ulcers of the throat, serpiginous sores of the skin or affections of the bones, symptoms which are undoubtedly rare before the disease has grown old. Consequently these cases of Hutchinson's showed no divergence from ordinary syphilis, in the characters which could be accurately reported, and the sole evidence of their wanting the usual form of initial disease was the patients' report, taken when the initial sore had had time to heal and disappear.

Hutchinson's cases form a fair sample of much of the evidence on which reliance is placed to prove infection of the mother by the child. Diday states that in ten of his cases, search was made for the initial lesion, but not till time enough had elapsed in many for it to have cleared away. This missing link in the

[1] Hutchinson: Medical Times and Gazette. 1856—7. Oct. 11, Dec. 20, Jan. 10.

chain of evidence, Zeissl has lately endeavoured to supply.[1] He adduces the cases of two women whose symptoms did not appear until after their conception of syphilitic children. In these cases, owing to the apprehensions of their husbands, who were being treated by him, Zeissl was able for a considerable time before the outbreak of syphilis in the wives to examine their genital organs almost daily (*sic*). He thus kept these ladies under close observation for two years; during this time he failed to detect anything that could be construed to be an initial lesion. Yet the ladies both bore syphilitic children, and suffered themselves from general syphilis during their term of gestation. These cases, if we accept them, show that the production of an initial lesion, on the parts of the body which are within the range of vision, is not a necessity.

Having set forth examples of the evidence which is accessible concerning the ways in which syphilis is described to reach the wife of a syphilitic man, it seems to us that the only *proven* mode of communication between adults is by ordinary contagion. At the same time, the evidence does not prove it to be impossible either that a woman may be infected by her husband without also developing the initial lesion, whether she conceive or not; or that she may be infected through the child. But it is, in our opinion, more in harmony with known facts to believe that the mother, having received the virus into her system, transmits it to her offspring at some period of its intra-uterine life.

Next, let us pass to a different part of the question of descent from the father. Here, though the father is syphilitic, and the child is infected, the mother is supposed to escape contagion.

Alleged escape of the mother.—A syphilitic man marries, his wife apparently retains good health both during pregnancy and after the birth of one or more syphilitic children. In these cases, be it observed as most important, the mother never contracts syphilis from her offspring *after its birth*, though the child may produce the virus in a form so highly contagious to others, that the communication of syphilis to wet-nurses from foster-children is a notorious fact.

The reality of the proposition that a man can procreate syphilitic children without also infecting his wife, is contested by most good authorities.[2] These observers maintain that in all cases where the

[1] H. Zeissl: Wiener Medizinische Wochenschrift. 1880, Jänner 24.

[2] Cullerier: De l'hérédité de la Syphilis. Mém. de la Soc. de Chirurgie. 1854, p. 230. Notta: Archives Générales de Méd. Mars, 1860. Charrier: Archives Gén. de Méd. 1862, vol. ii., p. 324. (One of Charrier's cases is curious. Both husband and wife suffered plainly from syphilis: infected children were born in 1855, 1856, and in 1858. The third child was born after seven months' pregnancy, and had a syphilitic eruption about the anus.

symptoms of syphilis have been reported to be wanting in the mother, they had only escaped detection by the reporter. Certainly in a very large number of the cases recorded as instances of the mother's non-infection, this objection is a fair one. But, in a few of them the examination has been so close and frequently repeated, as to render it practically certain that the mothers, if they had syphilis at all, suffered most lightly and not in the ordinary manner. In consequence of this apparent non-infection of the mother, there is a phalanx of specialists who believe that the escape is real; and this view is widely entertained by general practitioners also.

In favour of the mother being really infected, though apparently sound, let us mention the following:—It is the rule for the mother of a syphilitic child to fail in health sooner or later after marriage. When pathognomonic signs of syphilis are not developed, there are usually others, denoting debility or mal-nutrition. The preservation throughout of robust health without any symptom of disease, in a woman whose husband and child are syphilitic, is rare. Zeissl[1] is very strong on this point, he says:—

"Latently syphilitic fathers can produce syphilitic children. The wife remains apparently sound, but the immunity is only apparent. Usually, women whose husbands suffer from so-called 'latent syphilis,' do not merely grow withered and lose their robust appearance, even when they have not been pregnant, but such anæmic women have glandular swellings, pain in the bones, swellings of the sternum, skull, tibiæ, &c.; from which affections only anti-syphilitic remedies will free them."

Zeissl's most matured convictions are very similar.[2] He does not deny the possibility of the mother's escape, but at the same time states that he never saw a woman who was not at least latently syphilitic when she had borne a syphilitic child.

Sigmund[3] is equally assured that the mother's escape is not real. He remarks, that whenever he finds a child born with unmistakable signs of syphilis, he also finds unmistakable signs of syphilis in the mother; and that no satisfactory case has come before him where the mother has remained free.

Fifteen days after the birth of this third child, the husband's mistress also bore a child, which was healthy, and so continued for three years. The mistress, mother of this healthy bastard, suffered in no way from syphilis. The question of the common paternity of the several children Charrier believed to be decided by the resemblance they all bore to the reputed father and to each other; particularly because all, father and children, had a special peculiarity of the thumbs.) Renard: L'Union Médicale. 1862, Dec. 24. v. Bärensprung: Die hereditäre Syphilis. 1864, pp. 77, *et seq.* Mireur: Essai sur l'hérédité de la Syphilis, 1867; and many more recent writers, especially Vajda: Wiener Medizinische Wochenschrift, Jänner, 1880.

[1] Zeissl: Lehrbuch, IIter Theil. 1872, S. 303.

[2] Zeissl: Wiener Medizinische Wochenshrift. 1880, Jänner 31.

[3] Sigmund: Syphilis ü. Venerische Geschwürsformen; Pitha ü. Billroth's Chirurgie, Band I., Abtheil 2, 1stes Heft. Also, Practitioner, August, 1876.

Oewre[1] collected the cases of forty-two syphilitic fathers and also of 896 children. From this evidence he satisfied himself that when a child showed signs of syphilis, that disease had existed either previously or simultaneously in the mother. Flindt[2] has recently published an able paper on inherited syphilis, founded on ninety cases treated by himself in the Communal Hospital of Copenhagen. He points out the weakness of evidence brought forward to prove the immunity of the mother, and states that in no single case was he able to satisfy himself that the mother had ever escaped infection. The latest expression of the opinions held by French physicians and surgeons is given in the discussion on Vaccinal Syphilis, which took place in the Medical Society of Paris, 1873.[3] In the course of this discussion, eminent authorities on syphilis ranged themselves, some for, some against the possibility of the mother's escape. No one, however, recounted a case which clearly established the mother's freedom from syphilis.

The following piece of statistical evidence is strongly in favour of the necessary infection of the mother. It is contained in a paper by Dr. Woodman,[4] written to demonstrate the relative frequency of the usual syphilitic affections in infantile syphilis, and their influence on the growth and development of the child. For the purposes of his paper he selected two hundred cases from among his own patients. In all of them the mother had suffered from typical secondary and tertiary affections, and in most of them the fathers also had had symptoms of syphilis.

An instance may be given here, to illustrate the facility with which the absence of syphilitic infection might be assumed, and to demonstrate the need for caution in concluding that the mother is not infected because she shows no signs of such taint:—

A woman thirty-seven years old, was admitted into University College Hospital under my care in February, 1880, with the following history:—She had been married thirteen years, and had always enjoyed good health until the last six months. She has been pregnant five times; her first three pregnancies, which occurred in the first, second, and fourth years after marriage, were miscarriages. Two years passed between her third and fourth pregnancies. The fourth resulted in a living child, which "had never had anything particular the matter with it." A similar account was given of the second living child, now

[1] Oewre: Om etiologien af den hereditaren syphilis, Nordiskt Med. Arkiv, vii., No. 14, p. 1—25. [A German abstract in Virchow u. Hirsch's Jahresbericht, 1875, S. 558.] See also Fordhandlingen ved de Skandinavische Naturforsheres tiende Möde i Christiania, Juli 6, 1868. Nordiskt Med. Arkiv, 1872, iv., No. 5, and the same for 1873, iv., No. 19.

[2] Flindt: Den Congenitale Syfilis und sorligt Hensyn til del ved samma supponerede Hereditets forhold. Diss: Kjöbnhaven, 1878. [A German summary by Bergh of Copenhagen, in Virchow ü. Hirsch's Jahresbericht für 1878, IIter Band, S. 553.]

[3] Discussion sur la Syphilis Vaccinale. Gazette des Hôpitaux, 1873, pp. 732, 773—74.

[4] Bathurst Woodman: Relative frequency and value of certain symptoms of Congenital Lues. (Reprinted from the Transactions of the St. Andrew's Medical Graduates' Association.) 1874.

three years old. The two children, girls, about five and three years old, were brought to the hospital for inspection. They were fairly well developed children, with no indications of syphilitic disease past or present. Two years ago the father died, and the mother had to work ten or fifteen hours daily as ironer in a laundry. About six months before coming into hospital, severe pain began to be frequent, possibly after a blow, in the front of the left leg. Never any pain in the right leg. Six weeks before admission, the skin at this part inflamed and broke into sores; the pain became so severe that she had to leave work and come into hospital. On admission, over the muscles of the front of the left leg, about two inches below the anterior tubercle of the tibia, was a red eczematous patch about as large as the palm of the hand. At about six places the skin was broken by shallow circular sores covered with crusts. The margins of these sores were not raised or thickened. The skin at this red area was very tender, but there was no swelling or doughiness to be detected. The veins were not enlarged, and there was no swelling along the shin. The patient, carefully examined and interrogated, gave no suspicion of syphilitic infection beyond the fact that her first three pregnancies were abortions. She was ordered to remain in bed, and to have the wound dressed with boracic ointment. Moderate diet, laxatives, and iron were prescribed. In a week's time, the red area had disappeared, and the ulcers were healing; but the pain was no less, being as severe by day as by night, and the tenderness still extreme. Three days later, two of the sores were found to be extending at one part of the margin while still healing elsewhere, and a small scab-covered tubercle had formed in the neighbourhood of the first sores. When this scab was removed, a cup-like hollow with a sharply cut margin was exposed.

The diagnosis of tertiary syphilitic ulceration of the skin was founded on the history of three miscarriages, the situation of the sores and their circular shape, and the tendency to serpiginous and repeated ulceration after the non-specific causes had been removed by rest, cleanliness, and attention to the natural functions. Iodide of potassium was then given. Diminution of pain was considerable in twenty-four hours, and total cessation was reached in three days, with rapid granulation and cicatrisation of the sores.—B. H.

This case has been narrated in detail because it is an excellent example of the difficulty that may impede the detection of the mother's disease. The woman had for thirteen years enjoyed good health, yet in the end she betrayed her syphilitic infection, and thereby furnished an explanation of her former miscarriages.

On the other hand, should the period of observation be but short, the evidence in favour of the mother's non-infection may be seemingly complete, though in reality worthless. For example, in the years 1854 to 1868 inclusive, 400 syphilitic infants were received with their mothers into the Foundling Hospital of Vienna.[1] Of these 400 cases the mother was recognised to be syphilitic in 122 before her lying-in. In 166 other cases the mothers had been delivered in the Lying-in department of the General Hospital, and during their three or four weeks' stay in that institution had been

[1] Pollak: Berichte des K. K. Findel Hauses zu Wien, 1854—1867; and for 1868, Medizinische Chirurgische Rundschau, 1870.

subjected to repeated examination both before and after their confinement; the reason of this careful observation of the condition of the mothers being that the women who are passed on into the Foundling Hospital are usually employed there as wet-nurses. The condition of the mother in the remaining 112 cases is not specified.

This statistic only confirms what is a matter of common observation—that mothers of syphilitic children do not always betray their own disease at or about the time of their lying-in. Yet this sort of evidence is gravely relied upon to prove the frequent escape from syphilis of women who bear syphilitic children.

Orth[1] narrates three cases which prove, in his opinion, that the mother may remain free of syphilis in families where a succession of syphilitic children are born; and consequently that the children inherit their disease directly from their father. In the first of his cases, minute examination discovered no trace of syphilis in either parent—if we admit that a succession of abortions and mature syphilitic fœtuses suggests no suspicion of syphilis in the mother. In the second case, the evidence of the father's syphilis was meagre in the extreme. In the third case, the mother had already had two miscarriages before her husband contracted syphilis.

The following case well shows how a woman may continue to bear syphilitic children without betraying her disease in her own person:

Grefberg[2] gives, from his own observation, the history of a woman who contracted syphilis, and was admitted with an indurated sore of the genitals into hospital on 13th August, 1864. Thirteen days later she had a roseolar and papular eruption of the whole body. During the next two years, with intervals of freedom from symptoms, she spent 299 days in hospital. While there she was continually and thoroughly treated with mercury. In 1866 her last symptom of syphilis was cured, and thenceforth she had no more signs of the disease in her own person. In the autumn of 1867 she married a healthy man. During the ten succeeding years, she miscarried eleven times. The twelfth pregnancy resulted in a child which, when six weeks old, was brought by the mother to Grefberg on 13th August, 1878. It had pemphigus of the soles, papular eruption of the body, mucous patches round the anus and coryza. The husband, interrogated by Grefberg, denied having had any symptoms of syphilis either before or after marriage, and showed no symptom on minute examination.

The most extensive collection of observations on the effect of syphilis when introduced into families is that of Kassowitz,[3] who pursued his investigations for several years among his out-patients at the Oeffentliche Kinderkrankeninstitut in Vienna, comprising the treatment annually of about 4,000 children, among whom would be between thirty and forty new cases of syphilis. Kassowitz professes

[1] Orth: Ueber die Immunität der Mutter bei Syphilis des Vaters, &c. Heidelberg, 1850.
[2] Grefberg: Vierteljahresschrift für Dermatologie und Syphilis. 1879, p. 102.
[3] Kassowitz: Die Vererbung der Syphilis, Stricker's Medizinische Jahrbücher. 1875, SS. 359—495.

to have examined repeatedly, through long periods, both parents and all the children of the families in which syphilis had passed from parent to child.

He thus obtained records of 119 families in which he had been able to watch the health of each member for a number of years. In forty-three families, where the father was syphilitic, the mothers remained throughout free from symptoms which Kassowitz considered could denote any syphilitic taint. But there is a weak point in the cases he quotes in illustration, which materially damages the value of his evidence; namely, his first examination of the mother did not take place until some months after the syphilitic child's birth; the account of the mother's condition during gestation being gathered, not from personal and repeated examination before syphilis was discovered in the child, but from the woman's own account of her health previous to the birth of the syphilitic child. Let us take of his cases one which he terms typical:[1]

> The father contracted syphilis between his 20th–25th years, and was treated for that disease in hospital. In 1867, when 33 years old, he married a girl of seventeen. In 1868 a child was born at term, which was marked by spots when a few days old and died soon afterwards. In 1870 a second child, who showed wide-spread eruption three weeks after birth, died when four months old. In 1872, a third child at four weeks old developed a macular syphilide, and died in a few days of pneumonia. In 1874 came a fourth child, healthy and strong, now one year old. The mother was not examined till 1870, soon after the birth of her second child (*i.e.*, three years after her marriage). She has been since then examined innumerable times, and has continued till now (1875), strong, well-nourished and blooming, free from every suspicious symptom. The husband was seen once in 1870, and then declined to undergo specific treatment. He was in 1875 reported to have continued quite well.

Now as the mother, in the case just quoted, was not examined until three years after her marriage, and two years after the birth of her first syphilitic child, it may be fairly urged that she had had the early form of syphilis before Kassowitz saw her, and had recovered sufficiently to show no more signs in her own person. In five other cases quoted by Kassowitz, ten months was the shortest time which elapsed between the mother's marriage to a syphilitic man and Kassowitz's examination. In the rest, marriage had taken place from three to five years before the mother's health was investigated by Kassowitz.

Such imperfect histories do not suffice to prove that the women escaped. But Kassowitz relies on two other points. The first is that, had the women contracted syphilis, their infection would have been recent—and in his opinion no recently-infected woman, except

[1] Kassowitz: Loc. cit., p. 385. IIIter Fall.

while actually under the influence of mercury, can bear a viable child. But in this assumption Kassowitz goes beyond evidence. Instances of children who survive their syphilitic inheritance, even though their parent has been only recently infected, are not difficult to find; an excellent example of this survival is now under our care. This question will be more fully discussed when speaking of the duration of the transmissive power.

The third proof on which Kassowitz relies for establishing the escape of the mother is, that when the father alone shows symptoms of syphilis, and tainted children are born to him, he can procreate healthy children if his disease be kept in abeyance by mercury, even though the mother be subjected to no treatment whatever. Such occurrences, were they fairly established as facts, would almost alone prove the direct descent of syphilis from the father to the child without the participation of the mother. On careful examination, all the cases accessible to us fail in some important point.

The observation published by Kassowitz to demonstrate this point is the following:[1]

The father, a man of easy circumstances, was infected in 1864; he was treated for primary and secondary symptoms and apparently cured. In 1867 he married a lady twenty years old.

Births:—1. At the end of 1867, a 6 months' old fœtus.
2. 1868, a 7 months' old dead fœtus.
3. 1869, a 3 months' old fœtus.

There was nothing indicative of syphilis about the fœtuses.

In the winter of 1872-3 the father was covered with serpiginous sores. For these he was treated with mercurial inunction and iodide of potassium, and was pronounced to be cured in the spring of 1873. At this date, the mother conceived a fourth time, and was delivered in January, 1874, of a full-grown, healthy and uncommonly vigorous child. The child came under Kassowitz's observation a few days after its birth. It never had any syphilitic symptoms, and is now (1875) strong and healthy. The father fell sick in the summer of 1873 of gummata and necrosis of the nasal bones and died in the summer of 1874 of miliary tuberculosis. The wife, who was never informed of the nature of her husband's disease, nor of the suspected cause of her own miscarriages, always enjoyed good health, according to the account of her family physician [not Kassowitz himself] and never underwent any anti-syphilitic treatment.

This case shows as much that the wife was herself infected, as that the three abortions were due to her husband's latent syphilis; and it does not prove that the transmissive power was quelled by mercurial treatment. The healthy child was not procreated until nine years after the father's infection and six years after the mother's possible contagion—ample time for the transmissive power to be lost by both parents, even when no treatment is applied.

In addition to his own cases, Kassowitz quotes a string of

[1] Kassowitz: Loc. cit., p. 391.

others, reported by various observers, not one of which is satisfactory; all fail through the omission of essential information.[1]

The Protection of the Mother.—Notwithstanding the apparently good health of a small number of the mothers of syphilitic children, numerous facts prove, in our opinion, that even when appearing perfectly free, the mother does not entirely escape. In the first place Kassowitz, in his long and continued 'surveillance' of the women whose families were syphilitic, discovered no case of a mother being infected by her own child.

The immunity from the contagion of syphilis which mothers of syphilitic children enjoy, was first pointed out by Abraham Colles in 1837, and since that time it has been known as "Colles' Law." As this law is so important, it may be well to quote Colles' own words:—

Colles wrote,[2] "I have never seen or heard of a single instance in which a syphilitic infant (although its mouth be ulcerated), suckled by its own mother, had produced ulceration of her breast; whereas very few instances have occurred where a syphilitic infant had not infected a strange or hired wet-nurse who had been previously in good health."

This statement of Colles, made forty-four years ago, has never been controverted. Of the few cases called exceptions, not a single one bears investigation. Cazenave[3] indeed expressed a belief in the possibility of exceptions, but narrates no observation on which to ground this belief: the case which he adduces is only one of the category mentioned by Colles and no controversion of "Colles' Law."

Brizio Cocchi[4] has reported the following curious case. A man who had been treated several times for sores on the penis, married a healthy woman. The first child was atrophic, and died when six weeks old. The wet-nurse

[1] Benjamin Bell: A Treatise on Gonorrhœa and Lues Venerea. 1797, vol. ii., p. 420—23. Bell's evidence on this point is quite as clear as any that has been since published. Evans: Dublin Medical Press. 1847, June 30, p. 407. Evans merely states that a *living*, not a *healthy* child, was born. This might have happened if his father had not been treated. Martinez y Sanchez: Essai sur la syphilis héréditaire. Thése de Paris. 1855, p. 30. In this case it is simply said that the father underwent a short second course of mercurial treatment, and that his next child was healthy; but it does not say how long a time elapsed between the father's infection and the birth of a healthy child; nor are any details concerning the mother's health given. Abelin: Mittheilungen aus der Kinderklinik im Allgemeinen Kinderhause in Stockholm, 1868. Translated into Journal für Kinderkrankheiten, 1870, Mai u. Juni Heft 5 u. 6, Band 54, S. 430. Two cases where the husbands were syphilitic, and two tainted children were born to each; the wives showed no symptoms, and underwent no treatment. The husbands were treated with mercury, and subsequently healthy children were born. The length of the interval which elapsed between the birth of the diseased and healthy children is not stated, consequently, supposing the mothers to have been infected, the interval might have been long enough to allow them to lose their transmissive faculty. Möhl: Memorabilien. 1868, xiii., 2. In this case the mother took iodide of potassium for four months during her gestation of the healthy child.

[2] Colles: Practical observations on the Venereal Disease and on the use of Mercury. 1837, p. 285.

[3] Cazenave: Traité des Syphilides, &c. 1843, p. 138.

[4] Cocchi: Gaz. Lombardia, 1858. No. x. Quoted by Orth: Loc. cit.

who suckled him had ulcers on the areolæ of the nipples, syphilitic tubercles of the vulva, and her husband a sore of the glans penis. [Cocchi does not tell us which of these several phenomena had precedence in point of time; an important detail when tracing the origin of the infection.] The second child died of hepatitis (?) when one month old, without any particular sign of syphilis. A year later, the mother, still apparently healthy, bore a third child; this child at six weeks old had a syphilitic eruption, after which it wasted away and died when three months old. The wet-nurse who suckled this child, also had mucous patches of the vulva, and her husband sores of the penis. Her breasts were not affected. The fourth child was born healthy, but nevertheless had in his sixth week a syphilitic eruption and died. The fifth child was suckled by the mother *herself*. *Ten* months after its birth sores appeared on her breasts, and a sore of syphilitic aspect on her abdomen. Then the mother had ozena and sore throat, which departed after a course of antisyphilitic treatment. The mother had no more pregnancies for three years and a half. The child born then was healthy, and the mother suckled him. Subsequent children were also healthy.

A very short examination of this oft-quoted case will show that little reliance can be placed on it as an example of contradiction to "Colles' Law." Firstly, the syphilitic history is very imperfect. Secondly, it is quite possible that the wet-nurses who suckled the first and third children, especially the third, caught their syphilis from their husbands, instead of themselves inoculating their husbands with disease. Thirdly, such symptoms as the mother is described to have suffered from do not resemble ordinary early syphilis; they much more closely correspond to relapses of old infections—ulcers on the breast and abdomen, followed by ozena and angina, are tertiary rather than secondary in their chronological sequence. If the mother's mammary sore had been initial, she should have had enlarged pectoral and axillary glands, and general roseola, rather than an ulcer on the abdomen, and ozena.

Guibout[1] claims to have shown Fournier an instance where a mother was infected by her own infant. He states that a mother brought forth a syphilitic child, and that while suckling this child four sores (chancres) appeared on her left mamma, one of which, according to Guibout, Fournier acknowledged to be a hard one. As Guibout, in his very meagre report of this case, gives no description of the child's health nor proof that it did not contract syphilis after birth, and as he gives no information concerning the subsequent health of the mother, nor of the state of her axillary glands, this case likewise cannot be received as an exception to "Colles' Law." Nothing is stated by Guibout to prove that the mammary sore was not a secondary affection, thickened by irritation; such an affection may so closely resemble an initial lesion (primary sore), as to be, by itself, indistinguishable therefrom. Ranke has reported a case of much greater value than Guibout's.

[1] Guibout: Nouvelles Leçons Cliniques sur les Maladies de la Peau. 1879, p. 154.

Ranke[1] states that in this instance, the father, thirty years old, and infected eleven years ago, had been without symptoms for nine years. Three years ago he married. A child born in the first year was syphilitic, and was cured by repeated treatment with calomel. The mother remained healthy until the birth of the second child, which was born at the end of the third year after marriage and fell ill at two weeks old of macular eruption and ulcers in the mouth. While suckling this child the mother contracted, at a small chap on the left nipple, a sore termed by Ranke a typically hard one. This was followed by a roseolous rash, which was dissipated by a course of mercuric inunction; and a relapse was similarly treated. The father and the elder child who had been under observation from the seventh month of the mother's pregnancy, showed no symptom whatever. No person had been employed to 'draw' the breast.

Ranke reports his case in more detail than any other yet brought forward to upset Colles' Law and, so far as it goes, it gives support to the doctrine which maintains that a mother may escape herself while bearing a syphilitic child. It is much to be regretted that a committee of skilled observers did not investigate this case closely and report upon it. Some important gaps in the evidence and sources of fallacy might then have been filled up. For instance, no information is given concerning the state of the subpectoral and axillary lymphatic glands. Nor are we told if the mother suckled her first, as well as her second child, the one which is claimed as the source of her syphilis. No other cases that have been reported as exceptions to Colles' Law are in the least trustworthy. Scarenzio[2] has recently brought forward a case which he considers an exception to Colles' Law; but as his report gives no evidence of a medical examination of either mother or child until the latter was seven months old, the case is of no value.

But independently of this immunity of the mothers from contagion by their syphilitic offspring, there is another incidental proof that they are not really free. Not only do mothers escape contagion from their own babes, but they are invulnerable by others. Not one of the forty-three quasi-healthy mothers of syphilitic children in Kassowitz's records contracted syphilis by any accidental mode of contagion, though nursing and living with syphilitic children. Corroborative of this may be cited the following experiment made by Caspary[3]:—

A man became infected with syphilis in 1872. He underwent a mercurial course at Aix-la-Chapelle and was apparently cured. During the two succeeding years, however, several slight syphilitic affections appeared, but were quickly dispelled by specific treatment. In October, 1874, his wife, who had previously

[1] Ranke: Ueber Ansteckung der Mutter mit lues hereditaria durch ihr eigenes Kind. Berichte der Verhandl. der 51. Versammlung deutscher Naturforscher und Aerzte in Cassel. Reported in the Medicinisch-Chirurgisches Centralblatt, No. 32. 1879, August 8, S. 374.

[2] Scarenzio: Giorn. Ital. d. Mal. Ven. e d. Pelle. 1880, Febraio, p. 16.

[3] Caspary: Vierteljahresschrift für Dermatologie und Syphilis. 1875, II. Jahrgang, S. 437.

borne healthy children, became pregnant and retained her usual good health throughout. In the seventh month she was delivered of a fœtus that had died in the third month. The placenta, moreover, was the seat of gummy disease. The mother quickly recovered from her lying-in, and continued strong and apparently healthy. After her recovery, Caspary inoculated at four places on her left arm, the secretions of a syphilitic patient taken from broad condylomata and mixed with some of the patient's blood. The result was negative.

Although one negative result following the test of intentional inoculation does not prove conclusively that the mother had been already infected, it strengthens the evidence furnished by the fact that all mothers may suckle and otherwise closely associate with their syphilitic offspring without thereby infecting themselves, while it is notoriously dangerous for any other person to take charge of a syphilitic child, and particularly so to give it suck.

The condition of the placenta when the child is syphilitic and evidence of syphilis is wanting in the mother, has been brought forward by Fraenkel[1] to prove that the infection of the child has come from the father, without the mother's necessary participation, and further, to explain the infection of the mother *viâ* the child (*choc en retour*). His paper contains the notes of twenty-one cases of childbirth. In three cases the mothers were infected with syphilis after the seventh month of pregnancy; the children were healthy, and the placentæ were not affected with those forms of disease which late investigations show to have a syphilitic origin. In a fourth case the placenta, that of an unmarried woman who had ozena and swelling of the lymphatic glands of the neck at the child's birth, was quite healthy. The post-mortem examination clearly showed that her child had syphilis. In the other seventeen cases, all the placentæ were affected. In three cases, which Fraenkel sets aside because the mothers were suffering from unmistakable syphilis during pregnancy, the disease of the placenta had originated in the villi of the fœtal placenta, and indeed was confined to that portion of the placenta in Cases I. and XIV., while in Case X. the change in the maternal part was very small, but extensive in the fœtal villi. In the remaining fourteen, the specific change affected only or began in the fœtal portion. This fœtal origin of the placental disease, Fraenkel relies on to prove that in these cases the child was affected directly by the father independently of the mother. To establish this, the evidence should be strong that the fathers were syphilitic and that the mothers were not so. It signally fails in both respects. Even had the father been clearly syphilitic the cases already alluded to show conclusively that syphilitic disease of the placenta may commence in either the fœtal or maternal portion, or

[1] Fraenkel: Ueber placentarsyphilis. Archiv für Gynaekologie. 1873, Bd. 5, SS. 1—54.

may be absent altogether, and that the locality of its development is no criterion of the mode of the child's infection.

The evidence in the fourteen cases where the fœtal portion of the placenta was the primary seat of the syphilitic disease when carefully examined amounts to this. First, the statement that the children were syphilitic is based on satisfactory post-mortem evidence. But respecting the condition of the fourteen fathers very little information is given. Nothing whatever was known of the health of eight fathers; one denied having had disease, and two not only denied it, but on examination furnished no trace of previous syphilis. Of the remaining three fathers, one confessed that he had had gonorrhœa before marriage, and one that he might have been infected with syphilis; lastly, there was no doubt about syphilis in one single father. So much for this evidence of the syphilitic condition of the fourteen fathers. Next, let us examine the account given of the health of the fourteen mothers who were supposed to have had no part in the syphilitic disease of the children. Two women showed signs of constitutional syphilis at the child's birth or a few days after delivery. Seven women had had miscarriages previously—one four and another five times. One other woman is described as "Puella publica," and another was unmarried and did not know who was the father of her child. This leaves only three mothers concerning whom no suspicious evidence is furnished in their family history. In short, the imperfect evidence on the one hand, that the fathers were infected, and on the other, that the mothers were free from syphilis, makes it impossible to accept the inference that syphilitic disease of the villi implies the child's infection directly from his father, still less does the occurrence of specific change in that organ substantiate the theory that infection passes from the child by spreading through the placenta of the mother.

To sum up what has been said concerning the mother's escape: it is clear that some women do bear tainted children without themselves showing ordinary signs of syphilis, but that they are, nevertheless, in some way protected from subsequent contagion. Hutchinson[1] supposes that such women have a form of syphilis so modified as to produce no external symptoms; and that, though they may have neither primary, secondary, nor tertiary manifestations, they are yet inoculated to such an extent as to be proof against further contamination by acquirement either from their husbands or from other sources. This may be so; but there is no doubt that the escape of the mother—that is, the direct infection of a child by its father—is not established as a clinical fact, nor is the infection of the mother

[1] Hutchinson: Med. Times and Gazette, Dec. 9, 1876; also Brit. and Foreign Med. Chir. Review. October, 1877, p. 45.

by her syphilitic child thus far proven. A careful examination of the evidence recorded, very much of which through its imperfection is absolutely worthless, and its comparison with our own experience, leads us to believe that the mother never does escape syphilis when she bears a syphilitic child. In all the instances which have been satisfactorily reported, her escape is not real. Commonly the mother has syphilis in the ordinary form.

II. *Descent from the mother* may take place in two ways. In the first, the mother has been infected with syphilis before conception. In these circumstances, the ovum may be imbued with the syphilitic poison, as it matures in the ovary. This is inheritance most strictly speaking, and such a mode of contagion may be for practical purposes subdivided as follows; (*a*) where the mother's infection is of no long duration; and (*b*), where the disease from long existence, has either become latent, or is limited in the extent of its symptoms.

The second manner in which syphilis may reach the infant before it is born comprises those cases where both parents are healthy at the time of conception, but the mother receives the poison into her system during gestation, and the child is *infected in utero*. This occurrence is not inevitable. Children free from syphilis are frequently born of mothers infected during gestation. The circumstances which prevent or promote infection of the child, will be more particularly alluded to in the section devoted to *Infectio in utero*.

Descent from the mother infected before conception.—(*a*). When the mother is infected shortly before conception and manifests secondary eruptions during gestation, the child rarely escapes syphilis. The severity of the disease in the offspring, and the length of time through which the mother's infective power continues, will be explained in another section. Cases of syphilitic inheritance where the father was clearly free from that disease are related by Diday,[1] and in ten families of Kassowitz's series,[2] the father was healthy and not the source of the mother's infection. The cases where this inheritance is most easily demonstrated are those of healthy women who, bearing healthy children to non-syphilitic husbands, are themselves infected by syphilitic nurslings, and thereafter suffer from syphilis in their own persons; the children whom they subsequently bear being syphilitic. The following is a good example of the facility with which wet-nurses may be infected by suckling the syphilitic offspring of others, and shows also that, when so infected, this infection passes to future offspring. In the case about to be related two women produced syphilitic children after their own infection.

[1] Diday: Infantile Syphilis, Engl. transl., pp. 23—4—25.
[2] Kassowitz: Loc. cit., p. 470. See also Grefberg's case, quoted on p. 50.

Bergeret[1] relates that in 1830 a woman, P—, was infected by a nursling from Pau. P—'s own child acquired syphilis from P—, after she was infected by the syphilitic nursling, and died in consequence. Subsequently, P— suckled for a few days the child of a neighbour, N., which child was thereby infected and died of syphilis; but not before N.'s child, in its turn, had infected N. herself by inoculation at the breast, where an initial sore developed, which was followed by enlargement of the axillary glands. In 1832, and again in 1834, N. gave birth to a child; the first was still-born, the second died with syphilitic eruptions when three weeks old. After the birth of the 2nd child (in 1834), N., heedless of an ulcer which she had on her nipple, persuaded C— to let her suckle C—'s child. Bergeret some weeks later found ulcers in the mouth of C—'s child and enlarged submaxillary glands; C—'s breasts being at that time quite sound. But a few days later, a small papule formed on C—'s left breast, and secondaries followed in due course. C—'s child died when seven months old of syphilitic marasmus. In 1839, C— bore another child which died when seven weeks old with copious signs of syphilis. In 1840, C— again became pregnant, but underwent a mercurial course, and the child survived. In 1844 C— suffered from nodes and other syphilitic affections.

(*b*). When the mother has been infected several years before conception, the child often escapes inheritance of her disease. As the tendency of syphilis is towards spontaneous recovery, the transmissive power gradually ceases in all cases. The length of time this power lasts varies greatly in different individuals, and will be described presently.

Infectio in utero.—When a healthy mother impregnated by a healthy father is infected during gestation, the fœtus is sometimes tainted; but sometimes it escapes. This mode of infection is called by some authors 'congenital syphilis,' to distinguish it from infection through parents already diseased before conception.

There are still those, Kassowitz[2] among them, who deny the possibility of a child inheriting syphilis except at the moment of conception. But as this theoretical objection to infection during gestation is at variance with known facts, space need not be occupied with its refutation; cases will be presently quoted showing satisfactorily the contamination of a healthy fœtus while still in the womb. Vajda[3] has written an exhaustive essay on this subject.

Our knowledge does not yet enable us to lay down all the conditions which promote or impede the infection of the fœtus. The mode of communication is doubtless by means of the placental circulation. This is the recognised medium by which the poison of scarlatina, variola, and other morbid agencies reach the fœtus.

There is great diversity of opinion concerning the period of gestation at which it is possible for syphilis to infect the fœtus, but

[1] Bergeret: Moniteur des Hôpitaux. 1853, p. 1157.
[2] Kassowitz: Loc. cit., p. 428.
[3] Vajda: Wiener Med. Wochenschrift. Nos. 30 and 32. 1880.

the later the mother is infected during gestation, the more often does the fœtus escape. Cullerier[1] believes that syphilis may pass to the fœtus at any time during gestation. Hutchinson[2] would seem also to hold this view. V. Bärensprung[3] and Ricord[4] believe that children are rarely infected when the mother contracts her disease after the seventh month of gestation; but v. Bärensprung's evidence is very imperfectly recorded, both concerning the time of the mother's infection and the escape of the children. Nevertheless, it is clear that when the seventh month is reached before the mother's contagion occurs, the child may escape. Boeck[5] relates an example of a woman who contracted syphilis after the seventh month and bore a healthy child. But escape is not certain: the following case shows that during the seventh month infection is possible.

Zeissl the younger[6] reports that O. X., 36 years old, never having had syphilis, left his wife, to whom he had been married two years, to go a journey on 15th July, 1877. The wife was then in the second month of her first pregnancy. On 24th July, O. X. had extra-marital intercourse. About twenty-one days after this coitus, he observed a small lump on the inner surface of the foreskin, and on 22nd August he consulted Zeissl the elder. On 23rd September a maculo-papular eruption of the skin with erythema faucium appeared. Under treatment these symptoms completely disappeared. On 29th October he went home to fetch his wife to Vienna for her lying-in, and had intercourse with her soon after his return, notwithstanding Zeissl's strict prohibition. At the beginning of December, a hard sore developed on the left nympha of the wife, who was then in the seventh calendar month of her pregnancy. At the end of December, a maculo-papular eruption spread over the body and was treated with mercury. On the 14th February, 1878, a well-grown and apparently healthy female child was born at full term. When eleven days old, a pustulo-scaly eruption came out on the child's soles and toes, and soon afterwards a maculo-papular eruption over the body generally. A few days later the child died. No post-mortem examination was permitted. In July, 1878, the wife had iritis, and after that gummata on the leg. She miscarried in July, 1878, at the third month, and again in February, 1879, at the second month.

It is also uncertain whether a mother can infect the fœtus before she herself suffers from the general symptoms of syphilis—that is during the stages of incubation and initial sore. She certainly often fails to transmit the disease at this time. But the following case tends to show that infection may pass from the mother before the stage of general eruption has been reached.

[1] Cullerier: Loc. cit., p. 253.
[2] Hutchinson: Med. Times and Gazette. 1877, vol. i., p. 206.
[3] v. Bärensprung: Loc. cit., p. 156.
[4] Ricord: Diday, Inherited Syphilis. Syd. Soc. Transl. 1859, p. 28.
[5] Boeck: Loc. cit.
[6] Maximilian Zeissl: Ein Beitrag zur lehre der hereditären Syphilis. Allgemeiner Wiener Medicin. Zeitung. Dec., 1879. Nos. 50, 51.

A woman free from signs of general syphilis, but with a hard sore of the labium and indurated inguinal glands, gave birth to a well-nourished infant at full term. After the birth of the child the mother had roseola and mucous patches on the lower lip. The child flourished for four weeks, but in the fifth week—that is, too speedily for the child to have been infected during or after birth—a general papular eruption, coryza, and fissures of the mouth appeared. In the following year the mother miscarried of her second child.[1]

When the mother reaches the period of eruption before gestation is completed, she almost invariably infects her offspring. The following instance shows that the child may suffer severely, and usually does not survive.

A woman contracted syphilis on the lower lip where a pustule formed and left a hard scar. The pustule appeared in the seventh month of her pregnancy, and was followed by a maculo-papular eruption of the trunk. Her child was born before the full term with spots and ulcers of the skin, and with gummy orchitis.[2]

The evidence which has been collected by various observers shows that the communication of syphilis to the fœtus by a mother infected during her gestation is not inevitable at any stage of her pregnancy. But the fœtus is the more certainly infected, the further the disease has developed in the mother before the child is born. Infection may undoubtedly take place as late as the seventh month, though it has not yet been proved to happen if the eighth month of pregnancy have passed before eruption appears on the mother. The influence of mercury in checking the transmission of syphilis to the fœtus is very great, and will be returned to presently.

Transmission of the taint when inherited by the mother herself.—It has been suggested that a woman, who has herself suffered from inherited syphilis, may in after-life transmit the taint to her offspring. Little is known of this question. Simon[3] indeed states that he has seen a case where there was a strong suspicion of the appearance of syphilis in the third generation, but he gives no description of it. Hutchinson[4] relates that he has seen an infant suffering from the inherited form of disease, whose mother also bore unmistakable marks of inherited syphilis. The woman's husband was under observation for a long time, but neither signs nor history of syphilis could be discovered, and a sycosis from which he was suffering was not benefited by antisyphilitic remedies. Still, as Hutchinson remarks, the absence of acquired taint could not be positively proved; and therefore this case must not be accepted

[1] Weil: Ueber dem gegenwärtigen Stand der Lehre von der Vererbung der Syphilis. Volkmann's Sammlung klinische Vorträge, No. 130. Leipsic, 1878.
[2] Lewin: Viertelj. für Derm. und Syphilis. 1874.
[3] Simon: Pathological Transactions. 1876, p. 421.
[4] Hutchinson: London Hospital Reports, vol. ii., p. 154.

as one of the transmission of syphilis to the third generation without further corroborative examples.

Infectio per partum.—This suggested mode of infection of the child—for no actual case of a child receiving the poison from its mother's genital sores while entering the world is on record—was at one time maintained by those who refused to recognise the fact of the inheritance of syphilis. Since that doctrine has been universally accepted the so-called *infectio per partum* has lost credence. The complete covering of the infant's body by the vernix and mucus during parturition protects the child not merely from syphilis, but from what would be far more easily imparted to him were he not so protected, namely, local chancre, and even of this accident no example has been yet recorded.

Transmission of syphilis to the child, though not imperative, is an almost invariable consequence during the first three or four years after the mother's infection. The escape is more common when the father is the only one actively syphilitic; the mother being merely infected in that latent manner which is explained by some, Kassowitz for example, to be no infection at all; and by Hutchinson to be little more than suffices to protect her from the consequences of ordinary inoculation.

Duration of the Transmissive Power in the Parents.—This certainly continues as long as the eruptions of the secondary stage are present; but it usually ceases when the tertiary stage is reached. The ability to transmit the taint to the offspring probably remains longer than that for communicating it to others by ordinary contagion.

Kassowitz's researches afford tolerably precise evidence of the length of time the transmissive power lasts, when mercurial treatment is not employed to cut it short. During the first three years after the parents' infection, the birth of a viable child was extremely rare. In the majority of his observations, healthy children began to appear in the families about ten years after the parents' infection. But the transmissive power might continue much longer. When the father was principally affected, it lasted six years in six families, eight years in four families, and in one family it continued active for twelve years. When the mother alone was syphilitic, in two families it lasted for nine years. When both parents were obviously syphilitic, the transmissive power lasted for eight years in two families: in one family, where the disease had not been specifically treated, fourteen years passed away before a healthy child was born. In Grefberg's case already quoted, thirteen and a half years after infection a syphilitic child was born, though mercury had been assiduously administered during the

first two years succeeding infection. Henoch[1] records an instance of a syphilitic child being born twenty years after the mother's infection. Hutchinson[2] gives an instance of eleven children being tainted in succession during a period of fifteen years, or between eighteen and nineteen years after infection. In this case, the disease originated in the father, who did not marry until three or four years after contracting syphilis, for which he was treated during six months, and had believed himself to be quite well for at least two years before marriage. Syphilis was never detected in his wife. This extremely long duration suggests the suspicion that the wife was herself infected, but that as she had no symptoms she was not treated, consequently the transmissive power ran its full course in her person.

In course of years, even if left untreated, the transmissive power grows less and less potent. At first it often destroys the fœtus within the sixth month of gestation; even the third or fourth child may only be carried to the eighth month. When three or four years have been thus consumed, the child is born at term but shows his disease either at birth or within one or two weeks after it. As time advances the children are larger, more vigorous, and reveal symptoms of disease more remotely from their birth, but always before six months have elapsed, and nearly always before they are three months old. Commonly in seven or eight years' time healthy children appear and the transmission ceases. This gradual diminution of the transmissive power as well as its long persistence is well shown in the following case of Kassowitz[3]:—

The father and mother had during 1857-1862, five healthy children. During his wife's fifth lying-in the father contracted syphilis, and some weeks later communicated it to his wife. She had a macular eruption, lost all her hair for a time, and had severe headaches. Neither of the married pair underwent any proper antisyphilitic treatment. The subsequent pregnancies ended as follows:—

6th, in 1863.—A dead fœtus at the eighth month.

7th, in 1864.—A girl at eight months marked with an eruption at birth; lived seven days.

8th, in 1866.—Girl at seven months, died immediately after birth.

9th, in 1867.—Girl at seven months, lived twelve hours.

10th, in 1869.—Girl born at term, had general eruption, sore lips, coryza, and died when two years old.

11th, in 1870.—Girl, at five weeks old, had a general rash, which was cured by mercury; so were relapses when she was nine and ten months old. Died when two years old of pneumonia.

12th, in 1872.—Girl, born at term, was *healthy*, and so remained till now (1875).

[1] Henoch: Beiträge zur Kinderheilkunde. 1868, S. 417. (Quoted by Kassowitz.)
[2] Hutchinson: British and Foreign Medico-Chirurgical Review. Oct., 1877.
[3] Kassowitz: Loc. cit., p. 448., XVIter Fall.

13th, in August, 1874.—Boy, strong and well-nourished. At six weeks old, a pustular peeling of the skin about the toes, and a papular eruption of the feet and hands. Cured by mercury. Child now (1875), healthy and unusually strong.

The mother had for several months during her tenth pregnancy, loss of voice and ozena.

Weil[1] concludes from his own observations that the usual duration of the transmissive power, when not influenced by treatment, is ten years, and the minimum seven years.

An interesting result of the capricious influence of the transmissive power in the parent is seen in the rare cases of *twin-births* from syphilitic parents. The two children may suffer unequally. One may be born dead, and its body be more or less decomposed or affected by obvious syphilitic changes, while the other, born plump and apparently healthy, is only lightly affected by the poison.[2] Or, if both children be born alive, one may have well-marked symptoms of syphilis at or shortly after birth, while the other is simply weak and puny.[3] In another instance,[4] one child was born dead and decomposed, while the other remained three weeks before it displayed symptoms of disease, of which it nevertheless rapidly sank a few weeks later. Still more remarkable is the twin birth where one child remained plump and healthy, while the other suffered severely. The reporter of this case does not say how long the child retained its healthy appearance after birth, so it is not clear that the seemingly healthy child wholly escaped infection.[5]

The latent condition of the disease in the parent is no bar to the transmitting syphilis to the offspring, though the fœtus, other things being equal, is more likely to be affected if symptoms of active disease appear in the mother during her pregnancy. Mercurial treatment alone can interrupt the continuity of the poisonous influence.

Causes which influence the Severity of Syphilis in the child.—The chief causes are, propinquity of the pregnancy to the date of infection, and absence of mercurial treatment of the parents. But some other conditions have influence. For example, the presence of active syphilis in the mother has a greater effect than when the disease can be detected only in the father; so also is it said to be more certain to affect the child when active in both parents, though

[1] Weil: Loc. cit.
[2] Campbell: Northern Journal of Medicine. May, 1844, p. 12.
[3] Luzinsky: Journal für Kinderkrankheiten. 1859, B. 32, S. 285.
[4] Clemens: Deutsche Klinik. 1853, No. 14, S. 157. A similar case is recorded by Mewis: "Syphilis Congenita," Zeitsch. für Geburtshülfe und Gynaekologie. 1879, p. 59.
[5] Hutchinson: British Medical Journal. Nov. 9, 1867.

it is not clear that the child suffers more gravely than when the mother alone is affected with active symptoms.

Abortion.—Among the first effects of syphilis on pregnancy is the occurrence of abortion. The most active cause of abortion is the condition of the parents. If they have been recently infected, or if the disease after an interval of latency, manifest new symptoms, abortion or premature labour is customary. What actual lesions determine the ejection of the fœtus are yet ill understood. Many that have been suggested as causes, such as syphilitic affections of the lungs (Depaul), liver (Gubler), or other viscera, are met with in infants born at term, while in the vast majority of the fœtuses born before the eighth month no pathognomonic syphilitic lesion is present. Flindt[1] indeed lays it down as an invariable rule, that pathognomonic affections are never discovered before the seventh month.

In the condition of the placenta will probably be found many exciting causes of abortion; partial or complete occlusion of the umbilical vessels is a very frequent condition. Nevertheless, in many of Fraenkel's[2] cases where disease of the placenta was detected, gestation had run the full term; on the other hand, in a large number of abortions, the placenta shows no sign of disease whatever.

Probably the awakening of the syphilitic virus into activity in the fœtus is a determining cause, for those children in whom the symptoms of syphilis do not appear until four, six, or eight weeks after birth are carried the full term, and are indeed often strong well-grown infants. The prodromal disturbance, fever, restlessness, &c., which precede the outbreak after birth, may possibly also in intra-uterine life precede the development of the appearances with which children born before the full term are often affected. The violence of the disturbance may suffice to kill the child; the dead fœtus is then the cause of abortion.

The outbreak of general syphilis in the mother during pregnancy may evoke such constitutional (pyrexial) disturbance as may suffice to produce miscarriage. For this reason, abortion before the sixth month is more frequent when the mother is obviously rather than latently syphilitic. This faculty, however, syphilis shares with scarlet fever or other excitant of constitutional disturbance.

Observations of the results of pregnancy in syphilitic parents show that a very large proportion of infected fœtuses are prematurely born. The percentage varies, according to different observers, from thirty to fifty-five per cent.[3] Kassowitz noted the occurrence of

[1] Flindt: Loc. cit.

[2] Fraenkel: Loc. cit.

[3] Kassowitz (loc. cit., p. 469) has collected the statistics of Arneth (Die Geburtshilfliche Praxis, u.s w. Wien, 1851); of Whitehead (quoted by Egan in Dublin Med. Press. March,

premature births in fifty-six of the one hundred and nineteen families which his notes include: the total number of abortions are classified according to the source of syphilis, in the following table.

TABLE *showing the mortality among syphilitic infants which is directly due to that disease.*

Source of Syphilis.	No. of Families.	Total Pregnancies.	Born Prematurely.	Born Dead.	Born Living, but died in less than six months.	Total Died of Syphilis.
Father alone showing symptoms	43	105	25	26	21	47
Mother alone showing symptoms	10	40	18	18	5	23
Both parents obviously syphilitic ...	23	76	39	28	24	52
Uncertainty as to which parent affected	43	109	45	39	30	69
Total	119	330	127 = 38%	111 = 33%	80	191 = 58%

MEM.—All those who survived six months suffered from syphilis, though it did not cause their death.

Again, single abortions in a family are rare. When the influence of the poison has undergone so little diminution that it causes abortion at all, it produces more than one, usually two or three, before a child is carried the full term.

It is also worthy of remark that syphilis, far from causing barrenness in families where it is present, has a somewhat reverse effect. By cutting short gestation, it enables the mother to conceive more frequently than the healthy woman whose pregnancies are prolonged to their full term.

The effect of inherited syphilis on the viability of the child is enormous.—By referring to the table it is seen that, of the 330 syphilitic children, 111 were born dead, and eighty died in less than six months after birth, making 191 out of 330, or fifty-eight per cent. killed by syphilis. Gerhardt[1] found in the *Poliklinik*, or dispensary practice of Würtzburg, that of 250 children dying in one year, forty-four were syphilitic, and that syphilis ranked fourth among the causes of death in children. The mortality of the offspring of syphilitic women has been also noted by Pick[2] in 106 cases: seven-

1851); of Hecker (Bemerkungen über S. Congenita. Verhandlungen der Gesellschaft für Geburtshilfer in Berlin. 1855, 8 Heft); of Hecker u. Buhl (Klinik der Geburtskunde. Leipsig, 1861); Pick (Wiener Medizinalhalle. 1873, Nos. 11 and 12); and others.

[1] Gerhardt: Deutsche Klinik. 1858. S. 85.

[2] Pick: Schmidt's Jahresbericht. Bd. cxx., S. 194.

teen of the children were born prematurely, and forty-four after full gestation; eleven of the seventeen and three of the forty-four were born dead. Of forty-seven living children only four lived more than three months; the average duration of life in forty-one others was twenty-six days.

It has been calculated[1] that the intensity of the effect of syphilis on the child may be divided into four degrees or stages, which are denoted by—

1st Stage. The continual occurrence of abortion.

2nd Stage. The completion of gestation.

3rd Stage. The production of a viable child.

4th Stage. The occurrence of an interval between the birth of the child and the appearance of symptoms.

It follows from the preceding that in the early years of infection the majority of women produce no living children but lose the fœtus by premature parturition.

When the tertiary period of the parents' disease is reached the children are usually healthy. It is difficult or impossible to define precisely when the transmissive power is ended. Its decline is very gradual, just as the progress of the patient's symptoms from secondary to tertiary is very gradual, and without distinct demarcation. Nor is the faculty for transmitting the disease always lost in the tertiary period. It simply ceases at that time to be a very constant obligation.

The effect of mercurial treatment of the parent on the transmissive power.—This is shown in two ways. In the first, mercury annuls the power of the virus altogether for the time being; in which case a healthy child may be born, even immediately following a miscarriage—an event that is never observed when the disease is allowed to wear itself out by gradual exhaustion. In the second and less complete way, the child is enabled to survive and probably suffers but lightly from the taint. This protection may be afforded at a period so recent after the parents' infection, that without the aid of mercury the pregnancy would have naturally ended in abortion. This effect is well illustrated by a case of Fournier's.[2]

A syphilitic woman bore seven dead children in succession. During her eighth pregnancy she was treated, and bore a healthy child. A ninth child was also born healthy during treatment. No treatment was resorted to during the tenth pregnancy: the child was syphilitic and lived only six months. The mother was again treated and the eleventh child was healthy.

The following case of Grefberg's[3] also shows the control which

[1] Roger; Étude Clinique sur la Syphilis infantile. L'Union Médicale. 1865, Nos. 10—19.
[2] Fournier: Gazette des Hôpitaux. Janvier 14, 1879.
[3] Grefberg: Zur Frage der erblichen Syphilis, Vierteljahresschrift für Derm. u. Syph. 1879, p. 102.

mercury exerts over the transmissive power even when the parent's infection has existed only eleven months.

In August, 1875, a student contracted syphilis, for which he at once consulted Grefberg. In January, 1876, roseola with affections of the fauces appeared. In July, a papular eruption followed, but was quelled by continuous mercurial treatment. At this time, against Grefberg's advice, the student engaged himself to marry, and furthermore rendered his betrothed pregnant. By this the marriage was hastened, and it took place in November, 1876. In March, 1877, a healthy child was born. This child and its mother were carefully watched by Grefberg until October, 1878. Neither showed any trace of disease during that time. Such a husband, as may be supposed, did not abstain from sexual intercourse with his wife, even though he had psoriasis palmaris in the spring of 1878.

This case of Mireur's[1] is even more remarkable in showing how the transmissive faculty may be kept in abeyance.

C. in January, 1863, had a hard sore of the furrow, soon followed by multiple enlargement of the inguinal glands. Mercuric treatment was begun, and had been continued for five weeks, when papulo-roseola, sore throat, crusts on the scalp, &c., appeared. Mercury was energetically administered for four months, by which time all symptoms had departed. In December, 1863, C. having seen no further development of his disease, presumed himself to be quite cured, and in spite of his doctor's advice, married a lady to whom he had been long engaged. Madame C. became pregnant very soon after marriage. In October, 1864, she was confined of a healthy vigorous boy. This child, extremely like his father, grew fast and remained healthy until two years old. Towards the end of 1866, C., who had almost forgotten his own infection before marriage, had a small excoriation on the front of his lower lip. Attaching no importance to this slight affection, C. did not refrain from kissing his child as usual. Shortly afterwards, there developed on the child's lip an excoriation with depressed surface and of dark colour, clearly hard at its base. This was followed by enlarged submaxillary glands, general roseola and mucous patches at the anus.

In this case, we must suppose that the father's infection was so far subdued by mercury that he was able to procreate without infecting either the child or its mother. But, the influence of the mercury having become exhausted, the disease manifested itself anew, and the child was contaminated by direct contact.

The following cases from my own observation also bear on this point :—

In the first case, the mother had been infected four years before, and during her pregnancy had palmar psoriasis and iritis. The child was born quite healthy, and has remained so for eleven months. The mother took mercury during the seventh and eighth months of gestation.—In the second case, the mother had been infected three and a quarter years, had ulcer of the tonsils, and a few scattered patches of lepra on the right shoulder; she had taken mercury previous to her pregnancy; during it, she took iodide of potassium. I have had opportunity of seeing her child frequently for two years and a quarter, during which time it has remained healthy.—In the third case, the mother had been infected one year and three-quarters; during pregnancy, she had a relapse of desquamating papules

[1] Mireur : Sur l'hérédité de la Syphilis. 1867, p. 26.

and mucous patches round the vulva for which she took mercury; her child is now nineteen months old and has been quite healthy from birth.[1]—B. H.

Vehicles of contagion.—Of these the most undoubted are the secretions of syphilitic lesions. The thin fluid of mucous tubercles and the discharge of the initial ulcer are the most frequent sources, because these affections are situated on the genitals and around the mouth. Narratives of experimental inoculation of syphilis, from mucous tubercles and indurated sores, are contained in the writings of Vidal (de Cassis),[2] Gibert,[3] Hübbennet,[4] v. Bärensprung[5] and many others, of whom Wallace,[6] of Dublin, was the earliest to employ this means of investigation. The works of Hunter,[7] Rollet,[8] Diday,[9] Langston Parker,[10] Langlebert,[11] Jeffrey Marston,[12] Henry Lee,[13] are stored with instances of incidental transmission of the disease by contamination with the secretions of secondary affections.

To illustrate contagion by the secretions of the general disease, the following examples may serve :—

J., 33, stated that some time ago, while fighting, he had received a blow on the cheek and eye which drew blood. To prevent a black eye the wound was sucked by his antagonist, after which it quickly healed. No further inconvenience occurred till six weeks later, when pimples appeared; these gradually enlarged, and a scab fell from them. When first seen by me, there were elevated flat tubercles on the upper part of the cheek and lower eye-lid of the right side, varying in size from a shilling to a split pea. They were not ulcerated, but desquamating, quite dry, and of brownish-red hue. The lymphatic glands at the angle of the jaw on the same side were enlarged. The man had a rosy rash on the forehead, chest, and abdomen; there was no sore nor scar on the penis, nor enlargement of the inguinal lymphatic glands; he took mercury, and ultimately recovered. While he was under treatment, he brought me his former antagonist whom I examined, and took the following note. F. M., 31, a wheelwright, relates that when he sucked J.'s cheek, he had a sore mouth, and also some sores on his penis which had existed for six weeks or two months before he struck J. He recollects that the lumps now in his groin were there then; has never noticed any rash on his skin, nor sore throat: he has been very well ever since. On examination the sore of the mouth proves to be a fissure at

[1] Kassowitz gives a similar case: Loc. cit., p. 444.
[2] Vidal: Traité des Maladies Vénériennes.
[3] Gibert: Traité des Maladies de la Peau et de la Syphilis. 1860, p. 456, *et seq.*
[4] Hübbennet: Die Beobachtung und das Experiment in der Syphilis.
[5] v. Bärensprung: Annalen der Charité, Berlin, Bd. IX.; and Friedrich, ueber die Lehren vom Schanker.
[6] Wallace: Lancet, vol. ii. 1837.
[7] Hunter: Palmer's edition, vol. ii., part vii., page 475, *et seq.*
[8] Rollet: Archives Gén. de Médecine, 1859; et Traité de Maladies Vénériennes.
[9] Diday: Histoire Naturelle de la Syphilis; and Infantile Syphilis, Sydenham Society's Transl. 1859, pp. 154—158.
[10] Langston Parker on the Modern Treatment of Syphilis.
[11] Langlebert: Du Chancre produit par la Contagion des Accidents Secondaires de la Syphilis.
[12] Marston: Medico-Chirurg. Trans., vol. xlv.
[13] Henry Lee on Syphilis. 1863.

the angle. One or two enlarged papillæ round this fissure are moist and scaling, but devoid of induration. There is no ulceration of the mouth or throat, the lymphatic glands are not enlarged under the jaw nor at the back of the neck. There is no eruption save one or two acne spots that have a coppery tint. On the penis are two scars with well-marked induration; the lymphatic glands in both groins are plainly enlarged, but not at all tender, and the skin over them has its natural colour. Under specific treatment the sore of the mouth healed, while the induration on the penis much diminished. When J. had been two months under my care, he brought his wife to me. Her chest, neck, shoulders, and arms were covered by a lichenoid eruption of coppery colour. The inguinal glands were enlarged on both sides; one of the caruncule myrtiformes was indurated and superficially ulcerated. Subsequently this woman had a scaling papular eruption, sore throat, &c. J., when interrogated afresh, said he had not desisted from intercourse with his wife though advised to do so when he first applied to me. On examination his genital organs were clear of eruption, and there was no discharge. The wife brought her child on one of her visits. This child, which was born before its father's inoculation, was healthy and well-grown. The mother, though ill herself, had continued to suckle it until the day she brought it to the hospital. On examination, the child was found to have a sore at the left side of the mouth, hard, elevated, and as large as a sixpence; the mouth elsewhere was quite healthy. Under the jaw on that side the glands were enlarged and knotty; there was no rash on the skin. The nostrils and the anus were clear, and there was no snuffling; at the outer side of the areola of the right breast of the mother was an elevated moist patch, from which a fissure passed to the nipple. In a short time blotches appeared on the child's body, and sores at the anus and in the throat. The symptoms readily subsided under small doses of grey powder, and the infant regained his health and strength. Both mother and child were seen again twelve months after their last symptoms, in the enjoyment of good health.—B. H.

The reasons for considering the disease in these three cases to have been communicated by the secretions of general syphilis are, that in the first and third cases, the primary disease began at the points to which these secretions had obviously been applied. In the second the evidence is not conclusive, but the patient was a respectable married woman, and her husband was undoubtedly syphilitic; hence it is highly probable that she received her disease from him.

Contagion through the discharge of indurated sores is too common and well known to need illustration; Fournier[1] has fully discussed this question.

When the *tertiary period* of the disease has been reached, the virus commonly loses its contagious quality. Sigmund[2] indeed affirms that both the substance of a gumma and the blood taken from it are inoculable, but he quotes no case in support of his opinion, which is

[1] Fournier: Ricord's Leçons sur le Chancre. Pièces Justificatives, 1858; and l'Incubation de la Syphilis. 1865.

[2] Sigmund: Practitioner. August, 1876.

contrary to that generally maintained; and hitherto all attempts to propagate the disease with secretions taken at this period have failed.[1] Vidal,[2] however, mentions a very doubtful case of accidental contagion from this source; while Bumstead,[3] who in his earlier editions was inclined to give credence to the possibility of contagion from tertiary lesions, in the last edition of his well-known work is more doubtful.

The Blood has been successfully inoculated in several instances, of which the following is the most clearly established:—

Dr. Bargioni, was publicly inoculated on the 6th of February, 1860, by Pellizzari[4] of Florence, who applied to a denuded surface of his arm blood taken from the vein of a woman suffering from an early general syphilitic eruption. By this inoculation Bargioni contracted syphilis and thereafter underwent several stages of that disease. First, incubation for twenty-five days; then a papule arose at the seat of the inoculation, which developed into an ulcer by the forty-fourth day. The lymphatic glands in the corresponding axilla enlarged simultaneously with the formation of the ulcer on the arm and subsequently the cervical glands enlarged also. On the sixty-fifth day, roseola appeared on the trunk.

There are also published the results of twenty-four similar experiments by different observers, of which seven were successful. Among the successful experimenters, besides Pellizzari, were Waller,[5] Gibert,[6] and Lindwurm,[7] each being successful in one instance. There were three other successful inoculations by the anonymous surgeon of the Palatinate.[8] A little doubt may attach to these cases on account of their anonymous authorship; but those of Waller, Pellizzari and Lindwurm are free from uncertainty, for their inoculations were made in public, and the blood was drawn with special precautions to prevent the accidental admixture of any other fluid.

It is unknown how long the blood retains its contagious power; but all experiments with the blood of persons tertiarily affected have failed to convey syphilis.

The part played by the blood in propagating syphilis during vaccination has been already described.

The Milk may possibly contain the virus in a communicable shape even when unmixed with blood, but little is definitely known on this subject. The following experiment does not establish the point, but is nevertheless worthy of record.

[1] Tanturri and Profeta: Quoted by Jullien: Maladies Vénériennes. 1879, p. 519.
[2] Vidal: Maladies Vénériennes.
[3] Bumstead and Taylor: Venereal Diseases. 1879, p. 431.
[4] Pellizzari: Gazette Hebdomadaire. 1863, p. 349.
[5] Cazenave's Annales de la Syphilis et des Maladies de la Peau. 1850—51, p. 184.
[6] Gibert: Traité des Maladies de la Peau et de la Syphilis. 1860, p. 457.
[7] Lindwurm: Quoted by Auspitz: Die Lehren vom Syph. Contagium. 1866, S. 217.
[8] Archives Générales de Médecine. Mai, 1858, tom. i., p. 603.

Voss[1] inoculated three women with the milk of a woman suffering from a papular syphilide and mucous papules of the genitals and anus. The mammary glands showed no sign of disease. The milk was obtained by pressure, and a Pravaz's syringeful was injected into each of the three women. In one, who was already syphilitic, there was no result. The second, who was suffering from urethritis, also remained unaffected. In the third, who had not had syphilis, inflammation and suppuration occurred at the seat of puncture, but the abscess was well in a week. Forty days after her inoculation, papules formed round the spot where the milk had been injected, and five days afterwards a general maculo-papular eruption with adenitis appeared. These symptoms were dispersed by mercurial treatment.

The extremely early appearance of the general exanthem, and the peculiar form of the initial lesion make corroboration of this experiment desirable.

Gallois[2] in a thesis on this subject refers to experiments by Padova[3] of Pavia and Profeta[4] of Palermo, who made in all seven inoculations or injections of the milk of syphilitic women with constantly negative results.

In connection with the transmission of syphilis by the milk, the following case recorded by de Amicis,[5] which is instructive in many ways, may be narrated.

A woman, up to her twenty-eighth year, had had three healthy children; while suckling her third infant she gave the breast to a strange child, and contracted syphilis at the nipple. She continued nevertheless to suckle her own child. A few months later the mother had a maculo-papular eruption, and her child had ulcers in the mouth and enlarged sub-maxillary glands. It shortly afterwards died. The mother suffered from syphilis with little interruption for six years. In this time she was seven times pregnant. The first three pregnancies ended in abortion at the third or sixth month; the next two children were born at full term but died soon after birth; the sixth and seventh children died of diphtheritic affections. After the death of the fourth and fifth diseased children, the mother took two healthy ones to suckle. Both these infants remained healthy and are now vigorous children. Ten years after infection she became pregnant of the eighth child. During this pregnancy she had an ulcerating eruption of the skin. The child was born at term and well nourished; it was given to a cousin to nurse as the mother had no milk of her own. The cousin believed herself to be healthy. But soon after taking the child she shewed a papulo-macular eruption and mucous patches of the nipples; two months later the nursling showed a similar eruption, and in the following year had a relapse. In this year the mother had also a recurrence of her syphilis in the shape of gummata of the skin.

[1] Voss: St. Petersburger Medizinische Wochenschrift, No. 23. 1876; and British Medical Journal, Nov. 11, 1876.

[2] Gallois: Recherches sur la question de l'innocuité du lait provenant des nourrices syphilitiques. Paris, 1877, pp. 53—55.

[3] Padova: Giornale italiano delle Malattie veneree e della Pelle. 1867.

[4] Profeta: Osservatore medico, fascie iii. 1871.

[5] Tom. de Amicis: Sulla non-transmissibilità della sifilide per messo del latte. Il Movimento Med. Chir. di Napoli. 1877, Dec. 31. [Abstract by Vajda in Wiener Med. Wochenschrift. 1878, S. 425.]

It is clear from the report of this case that the mother, though still liable to tertiary disease herself, was able to suckle other children than her own without giving them syphilis.

The Saliva has also been employed for experimental inoculation. Profeta[1] and Diday[2] inoculated the saliva taken from persons suffering from early general eruptions with negative results. The *tears* have been similarly inoculated by Vidal.[3]

The Sweat is by the same failure of result believed not to contain the virus.

The Semen cannot be asserted to be contagious with the knowledge we at present possess. Nevertheless sexual intercourse should not be permitted to a man in whom syphilis has been recently active, even when he is quite free from external signs of disease. Mireur,[4] with the object of elucidating this question, made the following carefully conducted experiments.

He inoculated the freshly procured semen of a man suffering from indurated scar, multiple adenitis, roseola, mucous patches of tonsils, palate and anus, on four individuals never infected with syphilis. In the first two, three punctures were made with a needle in each arm. In the third patient a blister was raised by means of ammonia on the right leg; charpie dipped in semen was applied to the denuded dermis for twenty-four hours. In the fourth, the epidermis was scraped from the left arm at the upper and outer part, and three small transverse incisions were made; charpie thoroughly soaked in semen was then applied and kept in position for thirty-six hours. The subjects of these experiments were daily examined for six weeks, and carefully watched for six months. During this interval, no local or constitutional sign of syphilis appeared. Two of the patients, when examined a year later, were found to be in good health.

The cases recorded by Jordan,[5] Isaac Smith,[6] and others, have no weight in deciding this question.

Mixture of the Virus with discharges of co-existing diseases.—The pus of chancres.—Syphilitic patients frequently contract the local chancre. The inoculation of pus from such sores on another person varies in its effect. Should the recipient be virgin as to syphilis, he may contract not merely a contagious local ulcer which begins to form as soon as the irritating principle has been applied, but syphilis in addition. This disease, when the incubation proper to it has terminated, reveals its presence by the appearance of the hard initial sore. On the other hand, should the patient already have had syphilis, the protective influence against a second attack of

[1] Profeta: Loc. cit.
[2] Diday: Quoted by Gallois: Loc. cit.
[3] Vidal: Quoted by Gallois: Loc. cit.
[4] Mireur: Annales de Dermatologie et de Syph. 1876—7, tom. viii., No.
[5] Jordan: American Journ. of Obstetrics. 1878, p. 126.
[6] Smith: Philadelphia Med. Times. Feb., 1875.

that disease intervenes, and his inoculation inflicts on him only the local suppurating sore.

Having stated that chancrous pus may contain the syphilitic virus, it must be explained that it is not invariably so charged. Observation shows that persons virgin of syphilis may escape infection when contracting a local sore from a syphilitic subject.

Tanturri[1] showed this remarkably. He took the pus of a suppurating sore, developing on a patient newly infected, but whose initial syphilitic ulcer had healed before the suppurating sore appeared. This matter was inoculated on the patient's own arm and produced a spreading ulcer, from which on the sixth and eighth days pus was inoculated on three other patients—two with old syphilis, the third with chronic pemphigus, but not syphilitic. The effect was the same in all three, viz.:—a suppurating sharply defined sore at the point of inoculation, but no general syphilis.

The uterine discharges of a syphilitic woman are probably capable of conveying syphilis. But the evidence that they have done so is imperfect, and leaves the question undetermined.

Gonorrhœal discharge from a woman recently affected with syphilis may impart the latter disease to healthy individuals. Thus, in former times may have arisen the belief that gonorrhœa and syphilis were the same disorder. The only case we have met with is the following:—

Tarnowsky[2] states that, in 1863, he experimented by inoculating on persons not infected with syphilis the gonorrhœal secretions of syphilitic persons. After failing eighteen times to produce constitutional infection he at last succeeded in implanting syphilis with the muco-purulent discharge taken from the vagina of a woman suffering from mucous patches of the fauces. Tarnowsky asserts that this patient had no ulcer whatever on the vagina or on the cervix uteri. The inoculation was practised on a woman affected with warty growths of the genitals, but who had never had syphilis. A new lancet was used, and great care was taken that no blood should be mixed with the muco-pus employed for inoculation. At the site of the inoculation, which was on the left arm, at first a small abscess formed, which healed after a few days, leaving behind it a hardness which afterwards became covered by a scab. Subsequently the axillary glands swelled, and the induration on the left arm remained perceptible for more than two months. During the tenth week after the inoculation, a syphilitic papular erythema appeared over the whole body. Further syphilitic affections reappeared on four different occasions during the succeeding six years.

Many have experimented with the gonorrhœal urethral discharges from syphilitic males, but all without success; for example, Basset[3] failed to produce a sore or constitutional syphilis by the inoculation of gonorrhœal pus from the urethra of a man who, two months before, had had mucous patches of the mouth and anus. The result

[1] Tanturri: Sull' eterogenia dell' ulcera non sifilitica. Il Morgagni, Disp. viii. 1874.
[2] Tarnowsky: Vorträge über venerische Krankheiten. Berlin, 1872, S. 58.
[3] Basset: De la simultanéité des Maladies Vénériennes. Thèse de Paris, 1862, p. 42. Quoted by Tarnowsky: Loc. cit., p. 62.

was negative both on the patient himself and on six other patients who had never had syphilis.

Interval which elapses before the Virus enters the system.—The length of this period is not certainly known. Arguing on the possibility that the virus, during the time which intervenes between contagion and the appearance of the initial lesion, is limited to the immediate neighbourhood of the point of inoculation, certain observers have of late repeated the experiment of cutting out hard sores, carrying the knife widely and deeply beyond the area of induration. The theory on which Auspitz,[1] who is one of the chief advocates of this method of procedure, bases his practice, may be stated as follows:—

The syphilitic virus enters the system by the absorbents. It first sets up plastic growth in the walls of the lymphatic vessels at the part where it is implanted. These walls thicken and throw off into their interior, cells which contain the virus; as these cells float along they convey the virus still further inwards. But the infiltration of successive parts of the walls of the lymphatic vessels also conducts the virus inwards. When a lymphatic gland is reached, the same proliferating process ensues in the gland until cells are sent off through the efferent duct to other glands, and so on to the thoracic duct. Thence, cells containing the virus are poured direct into the circulation by the veins, and thus are quickly carried to the several tissues of the body. Then appear the signs of general constitutional infection.[2]

According to this theory it is clear that if the part first infected can be cut out completely, proximate extension is prevented, and ultimate general infection cannot ensue.

Auspitz, with the object of preventing general syphilis, cut out thirty-three well-marked indurated sores in cases where there was also more or less swelling of the neighbouring glands; some of the patients had further signs of general infection as well. The wound left after excision always healed kindly. In six, union by first intention took place. In twenty-five the wound healed by granulation. In nine of the cases, which were kept under observation from eight to

[1] Auspitz ü. Unna: Vierteljahresschrift für Dermatologie ü. Syphilis. 1877, 1 Heft, p. 161. Auspitz: Uber die excision der Hunterschen induration. Wien, 1879. See further:—Heuter: Berliner Klinische Wochenschrift. 1867. Langenbeck und Ulrich: Canstatt's Jahresbericht. 1868. Vogt: Berliner Klinische Wochenschrift. 1871. No. 2. Neumann: Allgemeine Wiener Med. Zeitung. Sept. 9, 1873. Folinea: Il Morgagni. August, 1879, p. 608. Sigmund: Ueber Neuere Behandlungsweisen der Syphilis. Wien, 1880, p. 35. Chadzynski: Annales de Derm. et de Syph. July, 1880. Rydygier: Vierteljahresschrift f. Derm. ü. Syph. 1880, p. 395, and, for a complete review of the subject, Leloir: Annales de Derm. et de Syph., 1881, p. 69.

[2] See also, on this subject, Otis: The Physiological Pathology and Treatment of Syphilis, &c. New York. 1881.

sixteen months, no signs of general syphilis appeared. Five others had no constitutional symptoms during a period ranging between four and six months in which Auspitz was able to watch them. Of the remainder, nine had undoubted secondary symptoms. In the other ten cases, secondary symptoms were present in some at the time of the operation; others absconded and were not afterwards heard of; and the rest, at the time Auspitz wrote his paper, had not been long enough under observation for him to include them in his statistics.

Auspitz always waited until the neighbouring lymphatic glands were more or less enlarged; in other words, until they were, according to his own theory, infected with syphilis, and to comply with the requirements of his theory, should themselves have been also removed. But this precaution was never adopted by the experimenter.

The proportion of success is so large in Auspitz's cases, when compared with the results obtained by others, that something must still be explained before reliance can be placed on his results.[1] Isidor Neumann[2] states that he experimented in several cases, without preventing the usual evolution of syphilis in more than two. In one of these he excised the sore, in the other he removed it by the elastic ligature, and no general symptoms had appeared five months afterwards.

Zeissl[3] has recorded the effects of cutting out the initial induration in five cases, in all of which, though induration did not reappear, general syphilis followed in due course. Mauriac[4] also has quite recently published seven carefully-recorded cases, in none of which was general syphilis prevented; although in one instance the initial lesion was excised only about fifty hours after its appearance, and before there was any trace of glandular enlargement.

In the face of such contradictory results, it is wiser to assume that we cannot indicate any period at which syphilis is a local disease which can be extirpated by local treatment. An instance of rapid absorption, in spite of a determined attempt to prevent ulterior infection of the system, may be here narrated.

In July, 1858, a gentleman came to me with the following story:—That morning, about four o'clock, during violent intercourse, he had felt a sudden snap. On awaking, a few hours after, he found that the frænum had been torn across, and that he had bled freely. This made him anxious to know if there were any means to insure him against the chance of syphilis. At 3.30 P.M. of

[1] Auspitz continues to maintain his view. See Vierteljahresschrift f. Dermatologie u. Syphilis. 1880, p. 281. Zur frage der Excision der syph. initialsklerose.
[2] Neumann: Allgemeine Wiener Med. Zeitung. 1873, Sept. 9.
[3] Zeissl: Wiener Med. Presse. 1880. Nos. 27, 28, 29.
[4] Mauria: Gazette des Hôpitaux. 1881. Nos. 7, 10, 14.

the same day, I examined the part, and found the frænum torn and the wound slightly swollen, but otherwise quiet enough. Ricord's views[1] were then in vogue—that destruction of the sore within five days of its existence would prevent syphilis, and I assured him that cauterisation would remove all danger of the disease. To make sure, I destroyed a considerable layer of tissue with fuming nitric acid. In due time the eschar separated. The surface healed very quickly, and my patient's satisfaction was extreme. This was at the end of July. In the latter part of August he called again, and showed me the cicatrix, which he said he had noticed that morning to have altered. It was clearly indurated. Presently the glands in the groin enlarged; general syphilis followed, and lasted a couple of years. The induration increased in the cicatrix, but it never ulcerated.—B. H.

Clerc[2] recites instances of the uselessness of ablution after intercourse, to prevent absorption. Among others, he relates the case of one of his pupils, who says:—"On the 10th of July, 1853, I had sexual intercourse, and *I washed myself immediately afterwards.* The following days I examined myself with much care. I detected absolutely nothing. On the 15th of July I left Paris for my father's house. I still took care to examine myself for the first few days after my arrival, but as nothing appeared I thought myself free of any venereal disease; on the 7th of August, while I was being shaved, a smarting pain on the penis attracted my attention. I went home at once, to see what was the matter, and I found on the right of the frænum a very small excoriation, slightly prominent, of yellowish-grey colour. I cauterised it with solid nitrate of silver; but all to no purpose, for in the beginning of October the general eruption followed."

Though of course not conclusive, and only slightly corroborative of these observations, are experiments which have been made with the virus of other diseases:

Clerc[3] vaccinated children by a single puncture through the skin: one hour afterwards he destroyed the tissues for some distance round the puncture, with solid nitrate of silver. Notwithstanding this, vaccinia followed in due course, and a second inoculation of vaccine lymph had no effect.

Somewhat different results followed the experiments of Aimé Martin,[4] who has published notes of seven cases of vaccination he performed on infants. The punctures were destroyed with Vienna paste, at periods varying from one hour to twenty hours after the operation. This treatment prevented the development of proper vaccine vesicles in all. The children were afterwards vaccinated again: in five this repetition had a negative result; in the sixth a genuine vaccine vesicle formed after thirteen days' incubation, and in the same case a pustule appeared three days after the second

[1] Ricord has completely abandoned this opinion. He now considers the destruction of the point of contagion to be absolutely useless. See Leloir: Annales de Derm. et de Syph. 1881, p. 96.

[2] Clerc: Traité des Maladies Vénériennes, pp. 45, *et seq.* Paris, 1866.

[3] Clerc: Oral communication.

[4] Aimé Martin: Thèse de Paris. 1863, p. 23.

vaccination, which had no distinctive character of vaccinia. Bouley and others found a very short time necessary for absorption, by experiments at the French Veterinary School of Alfort. At that institution horses were inoculated with glanders, and the inoculation was cut out one minute after insertion, but not before the glanderous poison was absorbed, for the disease followed. Sheep also were subjected to a similar experiment, for variola ovina. In them also the disease followed in due course.

Hutchinson [1] finds it very difficult to believe that absorption of the syphilitic virus is so rapid that there is no stage during which it remains limited to the seat of inoculation; he prefers to act as if this stage comprised the first week or ten days after contagion. Nevertheless it is certain that the poison may be absorbed within a very short time after its application to a breach of surface.

Communication of Syphilis to the lower animals.—Since the time of Auzias Turenne,[2] who made many attempts to obtain a form of disease that should bear the same relation to true syphilis that vaccinia does to variola, the results of the implantation of secretions of syphilitic affections into the bodies of various lower animals have been reported as proofs of the successful inoculation of syphilis in them. Dogs, cats, guinea pigs, and especially monkeys have been thus victims of persevering attempts; but none of the reported cases are sufficiently clear in the details of the consequences of these inoculations to give an unmistakable picture of syphilis.

There is no doubt that the pus of a local venereal sore will excite an inoculable ulcer in the lower animals; but the evidence is most imperfect that true syphilis is communicable to any animal but man.[3]

Lanceraux [4] has given a very clear summary of the results of experiments of this kind, and also describes the changes discovered in a guinea-pig which died some months after having a morsel of a hard sore inserted under the skin. This experiment produced a chain of symptoms and a series of lesions, which somewhat resembled syphilis, but which more closely resembled the plastic changes due to chronic irritation set up by the inoculation of guinea-pigs with ordinary pus, tubercular matter, &c.

Klebs has lately[5] published *in extenso* an account of two experiments of inoculating the material of initial induration of syphilis under the skin of apes.

In one experiment Klebs injected a small quantity of solution of isinglass in

[1] Hutchinson: Lancet, vol. ii. 1875, p. 445.

[2] Auzias Turenne: Bulletin de l'Académie de Médecine. 1844, t. 10, p. 212.

[3] See:—Horand et Puech: Annales de Dermatologie et de Syphilis, tom. iv., p. 387. Bradley: British Medical Journal, Sept. 30, 1871.

[4] Lancereaux: Traité de la Syphilis, 2nd edition. 1873, p. 596.

[5] Klebs: Beiträge zur Pathologisch. Anatomie, II. heft. 1880, SS. 89–90. These experiments had been before described in the Vienna medical journals in 1878 and 1879.

which pieces of the initial sclerosis of a hard sore had been macerated for a few days. About five weeks later the monkey had ulcers on its gums and tongue resembling venereal sores on the human subject by their sharply cut edges, &c. Fifty-five days after the injection the monkey was killed, and certain cheesy deposits were found between the skull and dura mater, in the lungs, and in the kidneys, which in Klebs' opinion closely resembled gummata of those organs in the human subject. The author does not mention the occurrence of any change at the point of inoculation in this case.

In the second experiment, the material employed for inoculation consisted of bits of the initial sclerosis itself which were inserted under the skin. No reaction took place at the points of insertion, the bits of syphilitic tissue gradually shrivelled up without suppuration. The symptoms were, slow enlargement of the lymphatic glands near the site of inoculation, and exactly six weeks after inoculation, a tubercular eruption of the skin of the head and face, being ushered in by a short stage of pyrexia. These nodules gradually subsided without ulceration, and five months after the inoculation the monkey died in a condition of marasmus. Post-mortem the skull had a worm-eaten appearance just under the parts of the skin where the tubercular eruption had been. The lungs and kidneys were also the seat of cheesy deposits.

We find nothing in these two experiments that specially suggest syphilis. Monkeys kept in confinement rapidly sicken and die from ordinary causes; and post-mortem appearances similar to those Klebs discovered in his inoculated monkeys are found in them.

SYPHILIS.

CHAPTER III.

THE INITIAL MANIFESTATION.

Incubation.—The consequences of contagion are not immediately manifested. The time that intervenes between contagion and the appearance of external signs of activity of the virus is called the *incubation period*. It may be employed in three ways:—*First.* When the vehicle containing the virus is of a non-irritating character, the broken surface heals and all trace of the inoculation disappears until the incubation is completed. *Secondly.* When the vehicle of the virus is pus or discharge of an irritating kind, inflammatory action at the point of inoculation takes place immediately. This inflammation subsides in a short time, and the part then remains quiet until the incubation is complete, when the syphilitic poison begins its presence by characteristic phenomena. *Thirdly.* If the syphilitic virus be of a specific character, the time of incubation is occupied in the process of absorption, which may or may not be accompanied with the symptoms of syphilitic poison beginning to manifest. The period of incubation varies with the individual, but is usually as follows:—

[illegible]

The forty-two cases in the adjoining table (p. 82) include all the trustworthy reports of experimental inoculation we have been able to procure. The incubation is stated with exactness in thirty-seven. In these the average delay before the poison became active was twenty-four days. The most common periods were twenty-five and twenty-eight days, and the extremes ten and forty-six days.

There is no reason to suppose the incubation varies according to the source of the poison. More probably, within certain limits, it is determined by some peculiarity of the patient. In corroboration of this view, it should be recollected that the incubation period of small-pox and vaccinia is not always the same to a day.

Fournier [1] discusses this question carefully, and gives a long list of cases of accidental syphilis where the incubation period was noted. Clerc [2] recites seven observations where opportunity occurred for marking the incubation. These gave an average of twenty-one days.

Though in the great majority of cases of accidental contagion, the incubation period corresponds exactly with that observed after experimental inoculation, instances which suggest much more speedy activity of the poison are recorded. R. W. Taylor [3] mentions a case where the initial lesion began to develope twenty-four hours after contagion. It appeared as a silvery spot the size of two pins' heads without the least elevation; this subsequently became a papule that ulcerated when a week old. In another case seven days elapsed before signs of change appeared. Hammond [4] has recorded an instance where only thirty-six hours passed between contagion and commencement of the initial lesion. Rollet [5] also mentions a case where he believes only nine days intervened. Probably the instances where surgeons have inoculated themselves while examining or operating on syphilitic persons, are those of least doubt among cases of accidental contagion. Two such instances of short incubation have occurred to us: In one, a surgeon was engaged in dressing a patient with phimosis and syphilitic sores between the 17th and 25th March; on the 30th March the initial lesion of a well-marked course of syphilis appeared. In another case, a surgeon delivered a woman with syphilitic mucous patches of the labia on 24th June. On the 4th July the initial lesion showed itself as an irritable papule at the junction of the skin and nail-matrix of the right thumb.

Of prolonged incubation Aimé Martin [6] relates a case where the

[1] Fournier: Incubation de la Syphilis. Paris, 1865.
[2] Clerc: Maladies Vénériennes, pp. 45, et seq. Paris.
[3] R. W. Taylor: Americ. Journ. of Syph. and Dermatology. 1871, p. 244.
[4] Hammond: On Venereal. Philad. ed. 1864, p. 66.
[5] Rollet: Pluralité des Maladies Vénériennes, p. 26.
[6] Aimé Martin: Thèse de Paris. 1863, p. 28.

TABLE OF FORTY-TWO CASES OF EXPERIMENTAL INOCULATION OF SYPHILIS; showing the Source of the Contagious Vehicle, the Length of Time that elapsed between the Insertion of the Poison and the Appearance of the Initial Manifestation, and the Date of the Development of the General Eruptions.

OBSERVER.	No. of Cases.	Source.	Length of Incubation before Change at Site of Inoculation.	First appearance of General Eruption after Inoculation.	Form of First Eruption.
Bärensprung[1]	2	Indurated ch.	28 days	55 days	Roseola.
,,		Mucous tubercles	28 ,,		
Cullerier[2]	1	Indurated ch., 2 inoculations	39 or 17 days	71 or 50 days	Roseola.
Galligo[3]	1	Mucous tubercles	17 days		
Auzias Turenne[4]	2	Mucous tubercles	18 ,,	55 days	Vesiculæ.
,,		,, ,,	25 ,,	37 days (circa)	Roseola.
Wallace[5]	6	Condylomata	28 ,,	75 ,, (circa)	Maculo-papular.
,,		Sore of penis.	21 ,,	77 ,, (circa)	Papular.
,,		,, ,,	15 ,,	75 ,, (circa)	Maculo-papular.
,,		Suppurating sore.	—	83 days	Vesiculo-papular.
,,		Pustular syphilide	29 days (circa)	67 ,,	Maculo-papular.
,,		Pustular syphilide	27 days	54 days (circa)	Maculo-papular.
Waller[6]	2	Mucous patches	25 ,,	52 days	Macular.
,,		Blood	34 ,,	65 ,,	Macular.
Rinecker[7]	2	Pustules of a new-born child	28 ,,	159 ,,	Mucous tubercles.
,,		Mucous tubercles	23 ,,	76 to 80 days	Lenticular.
Guyenot[8]	1	Mucous tubercles	28 ,,	82 days	Papular.
Gibert[9]	1	Bloody serosity of a tubercle on forehead	35 ,,	73 ,,	Scaly eruption.
Pellizzari[10]	1	Blood from vein of arm	25 ,,	65 ,,	Roseola.
Lindmann[11]	1	Secretion of ulcerated tissue	10 ,,	84 ,,	Roseola.
Vidal de Cassis[12]	1	Secondary pustule	35 ,,	174 ,,	Roseola.
Danielssen[13]	1	Indurated chancre	46 ,,	About 15 weeks	Herpetic eruption.
Anonymous surgeon of the Palatinate[14]	12	*a.* Mucous tubercle	18 ,,	45 days	Maculæ.
		b. ,, ,,	23 ,,	130 ,,	Maculæ.
		c. ,, ,,	15 ,,	83 ,,	Maculæ.
		d. ,, ,,	17 ,,	61 ,,	Maculæ.
		e. ,, ,,	17 ,,	43 ,,	Maculæ.
		f. ,, ,,	25 ,,	64 ,,	Maculæ.
		g. ,, ,,	31 ,,	64 ,,	Maculæ.
		h. Sore by inoculation on another patient	23 ,,	58 ,,	Maculæ.
		i. ,, ,,	16 ,,	64 ,,	Maculæ.
		k. Blood	—	93 ,,	Maculæ.
		l. ,, ,,	—	111 ,,	Maculæ.
		m. ,, ,,	—	134 ,,	Maculæ.
Kussmaul[15]	1	Ulcer at corner of the mouth	25 ,,	A few weeks	Roseola.
Lindwürm[16]	4	*a.* Ulcer	15 ,,	33 days (circa)	Papular.
		b. Ulcer of an inoculation	19 days (pustules in 36 hours, lasted 6 days)	67 ,, (circa)	Roseola.
		c. Mucous tubercle	21 days	.. ..	Macular eruption.
		d. Blood	4th week	.. ..	Maculæ.
Hebra & Rosner[17]	3	*a.* Mucous tubercles	16 days	76 days	Maculæ.
		b. Soft ch. inoculated on a syphilitic man	36 ,,	69 ,,	Papulæ.
		c. Indurated ch.	22 ,,	73 ,,	Papulæ.

[1] Annalen des Charité-Krankenhauses, Berlin, 1860. Bd. IX.

[2] Fournier: L'Incubation de la Syphilis. Paris, 1865, p. 30. (This case is by some authors attributed to Puche.) [3] Idem, p. 33.

[4] Gibert: Rapport Officiel sur la Contagion des accidents secondaires de la Syphilis. Bulletin de l'Academie de Médecine, p. 888. 9 Mai, 1859. [5] Wallace: Lancet, vol. ii. 1836—7, pp. 535, 536, 538, 616, 620, 621.

[6] Waller: Prüger Vierteljahresschrift, 1851. Annales des Maladies de la Peau, t. iii., p. 185.

[7] Rinecker: Archives Générales de la Médecine, 1858; Verhandl. der Wurzbürger ärztl. Ges., Bd. i., S. 117. u. Bd. iii., S. 375.

[8] Guyenot: Gazette Hebdomadaire, 1860; Thèse de Paris, 1859; Follin: Pathologie Externe, vol. i., p. 735.

[9] Gibert: Rapport Officiel, &c. (see No. 4). Four cases have been attributed to Gibert; but the first two reported by him are those of Auzias Turenne, given above; the third is so defectively reported as to be useless; the fourth case is given in the table.

[10] Pellizzari: quoted by Lancereaux: Traité de la Syphilis. 1873, p. 476. Gazette Hebdomadaire. 1863, p. 349.

[11] Lindmann: Rapport sur un fait relatif à la Syphilisation. Bulletin de l'Academie de Médecine, 20 Juillet, 1852.

[12] Vidal: Maladies Vénériennes. 1853, p. 358. Cazenave's Annales de Maladies de la Peau et de la Syphilis. 1851, 1852, p. 115.

[13] Danielssen: Deutsche Klinik. 1858, p. 322. [14] Canstatt's Jahresbericht. 1856, vol. iv., p. 337.

[15] Kussmaul: Untersuchungen über den Constitutionellen Mercurialismus und sein Verhältniss zur Constitutionellen Syphilis. Würzburg, 1861, S. 30.

[16] Lindwürm: Die Lehren vom Syphilitischen Contagium; Auspitz. Wien, 1866, S. 217.

[17] Hebra and Rosner: Idem, S. 225. Cases of experimental inoculation have also been recorded by Rollet: (Archives Générales de Médecine. 1859.) Belhomme: (Bulletin de la Société des Sciences Méd. de Lyon. 1864); and Bouley: (Schnepf, Cazenave's Annales des Maladies de la Peau et de la Syphilis, t. iv. Oct. 1851, pp. 7—8); but they are not described in sufficient detail to be included in this list.

initial lesion developed on the labium of a girl after she had been for seventy-two days shut up in the prison of St. Lazare. Fournier[1] also mentions a case where incubation occupied two months and a half, and alludes to one under the care of Guérin where the period probably embraced seventy-one days. Fox[2] of New York reports an instance where two months and a half elapsed between contagion and the development of the initial lesion.

The Initial Manifestation.—The morbid changes which occur at the site of inoculation vary in their aspect to a certain extent, even when solely due to the awakening activity of the virus. The resulting affections have received various names, such as, infecting chancre—non-suppurating chancre—indurated chancre—primary, or primitive syphilis. Perhaps the term *initial manifestation* or *initial lesion* is the least objectionable, because it comprises all the various phases in which the disease reveals its presence, without describing them or attempting to distinguish one from another. As these initial manifestations are often slight, and of short duration, it has been maintained that they may be completely absent, and that the disease may run its course without any indication at the point of inoculation. This is erroneous. *Some change always takes place at the point of inoculation.*

In 1856, 826 male patients with constitutional disease were treated at the Midi Hospital; in 815 of these the initial lesion could be clearly traced; in only eleven could its presence not be unquestionably proved, but circumstances made it extremely probable that it had appeared in every one.[3] In women the initial lesion frequently escapes notice. Clerc failed to find it in a fifth of the women admitted with recent syphilis. At the London Lock Hospital also, among the ordinary female patients, it frequently happens that the point of entrance of the virus cannot be found, because they rarely apply for relief until their malady has advanced beyond the stage of initial lesion. On the other hand, in the women sent under the operation of the Contagious Diseases Acts, whose disease is detected in its earliest stage, the initial lesion is found to be regularly present.

Varieties of the initial manifestation.—These differ from each other only in degree of development, not in essential structure—they are three: 1. *The elevated desquamating papule;* 2. *The superficial hard ulcer or erosion;* 3. *The indolent ulcer with a hard widely extended base.* All are quite independent of any change produced by the mixture of irritating matter with the vehicle of the virus, to wit, that from suppurating chancre, or inflamed ulcers. When irritating

[1] Fournier: Syphilis chez la Femme. 1873, p. 16.
[2] Fox: Archives of Dermatology. July, 1879, p. 267.
[3] Fournier: Ricord, Leçons sur le Chancre, p. 325.

matter is inserted with the virus, the changes at the point of inoculation are either those set in action by the irritating material, or a compound of them with those proper to syphilis; the chief of which is induration of the tissue around the inoculated point. The changes observed to take place when immediate irritation at the point of inoculation has been prevented will first be described; next, the aberration from these typical changes that local irritation of different kinds produces. Too much weight must not be attached to the differences of these sores for the purpose of diagnosing the absence or presence of syphilis in any given venereal ulcer. This can be done readily in most cases, but it is for a time impossible to do so in some where the amount of irritation masks or destroys any character that is peculiar to syphilis.

1. *The desquamating papule* begins by forming a small solid elevation at the point of inoculation; this, at first the size of a pin's head, may extend until it reaches that of a sixpence or a shilling. The skin around retains its natural aspect, and no inconvenience, except now and then a little itching, is felt. The colour is reddish coppery or reddish purple, like raw ham. The surface, slightly raised above the skin, is flat and smooth, being covered by a few thin scales of dry epithelium. Sometimes the papule undergoes no further change, but after five or six weeks grows pale and gradually disappears. When the site of inoculation is the scar of a previous chancre the cicatrix is thickened by this new deposit, which then frequently assumes an irregular form; instead of round or oval, it becomes angular, or linear; in these cases the coppery tint is often altogether absent, and the surface retains the same hue as that of the surrounding skin. The desquamating papule is most frequently seen on the skin, in situations where it is kept dry and not chafed; but it is much less commonly met with than are the ulcerating lesions.

2. *The superficial hard ulcer or erosion* is the most common form of initial lesion. A favourite locality for it in men is the inner surface of the foreskin, and in women the opposed surfaces of the labia and nymphæ, where the parts are constantly moist. For its production the surface of the elevated papule becomes red and secretes a discharge, usually thin and serous, but occasionally puriform. These eroded surfaces are sometimes similar in appearance to the mucous patches of the general eruption which, like them, owe their peculiar character to the constant moisture. Sometimes, as on the sheath of the penis, the induration is very scanty, and the surface consequently is only slightly raised; the discharge, if allowed to collect, dries and forms a scab or even thick crust. Thus the true nature of the lesion may be masked until the scab has been removed.

The sore has no tendency to extend nor, unless irritated, to suppurate. Its edges are clearly defined, which character, with the small amount of induration, causes it to slightly resemble the local contagious chancre.

3. *The indolent ulcer with a hard widely-extended base* begins as a papule; but the surface, instead of stopping short at desquamation, ulcerates. The ulceration begins at the centre of the indurated area and spreads outwards, but does not extend beyond it, wherefore the resulting cicatrix is small and often imperceptible. The fully developed sore has the typical appearance of what used to be termed the 'Hunterian chancre.' The base is hard and resisting, feeling between the finger and thumb like a cup of gristle set in the skin; its surface is covered by a scanty adhesive yellow discharge, the edges are sloping and rounded, and the induration extends beyond the area of the ulcer.

The progress of the initial lesion is always slow and, if the sore be kept clean and free from irritation, terminates by cessation of the ulceration, cicatrisation of the surface, and absorption of the indurated deposit. The duration of the initial manifestation varies from three or four weeks to several months, if not shortened by treatment.

Effects of local irritation on the initial manifestation.—When pus is mixed with the syphilitic virus, irritation and inflammatory action set in without delay at the breach of surface to which the matter has been applied. Vidal[1] inoculated the discharge of syphilitic ecthyma on the arm of a medical student. A pustule formed in three days, and healed in fifteen days; the remainder of the incubation was passed in tranquillity until the thirty-fifth day, when the initial manifestation began with the production of two papules which ulcerated and were the prelude to general eruption. The immediate irritation in this case was exactly similar to that which the same matter produced when Vidal[2] inoculated it on the syphilitic patient whence he obtained it, though in him, of course, this immediate irritation was the sole result of inoculation.

A parallel change takes place if the syphilitic poison be mixed with that of the local suppurating chancre; irritation begins immediately, producing, in two or three days, a soft sore with purulent discharge which runs its course irrespective of the incubation of the syphilitic virus. If the sore be still open when the incubation ends, it acquires an indurated base. If, on the contrary, the sore has healed before the incubation of syphilis terminates, the scar hardens, and may or may not ulcerate also. The twofold action is shown on the

[1] Vidal (de Cassis): Maladies Vénériennes, p. 358.
[2] Vidal: Loc. cit., p. 356.

one hand by the inflammation and ulceration that take place immediately after contagion, and on the other by the induration that is developed some weeks later.[1]

Mixture with the matter of a soft chancre is not the only way in which the initial lesion of syphilis may be made to furnish a contagious pus which, when inoculated, produces a succession of pustules where the matter is inserted. Mechanical irritation has been successfully employed for this purpose by Lee,[2] Bidenkap,[3] and Lane and Gascoyen.[4] The last-named gentlemen, when experimenting with various kinds of pus, obtained a freely inoculable matter by irritating a non-suppurating hard sore for one or two days with savine.

The suppurating ulcer with an indurated base and an auto-inoculable discharge, is called by Rollet[5] the '*mixed chancre;*' which term denotes that both contagious principles are present in the sore. This explanation appears to be satisfactory, as there is no reason why the two should not be present together, and Rollet, Laroyenne,[6] Sigmund, and many others have succeeded in making indolent hard ulcers inoculable on their bearers by touching them with pus from soft chancres.

In such various ways may syphilis begin. All the varieties of initial lesion, when uncomplicated with local irritation, are of themselves mild affections, disturbing the system very little, and therefore in many persons—especially females—are altogether overlooked.

Acute inflammation, suppuration, and even sloughing occasionally attack the initial manifestation of syphilis. These are present only when the patient has, in addition, some local or constitutional irritation not part of syphilis. Phagedæna is generally a consequence of irritation acting on an exhausted or debilitated constitution concurrently with syphilis, but sometimes it occurs when no such cause can be ascertained.

Number.—The initial manifestation is rarely otherwise than single; but occasionally several lesions are met with on the same person.

Of 103 cases of early syphilis admitted into the Male Lock Hospital in 1876-7, I noted that in ninety-one there was only one initial lesion; of the remaining twelve patients, seven had two sores, and five had more than two.—A. C.

[1] See Danielssen's case, Chap. XV.
[2] H. Lee: Syphilitic Inoculation. 1865.
[3] Bidenkap: Wiener Med. Wochenschrift, 1865, No. 34; Auspitz, Die Lehren vom Syphilitischen Contagium, p. 322. 1866.
[4] Lane and Gascoyen: Med. Chi. Trans. 1867. (Cases treated by Syphilisation, Nos. 9 and 22.)
[5] Rollet: Pluralité des Maladies Vénériennes. 1860.
[6] Laroyenne: Annuaire de la Syph. 1858.

Chance favours absorption at one point rather that at many; still, if the virus happen to be applied to several breaches of surface about the same time, a similar number of initial lesions may subsequently appear. Thus, if a patient be suffering from herpes or from balano-posthitis at the time of contagion, he will often contract more than one sore; or the whole prepuce or glans may assume a leathery consistence from diffusion of the syphilitic induration. The largest number of initial lesions that has come under our observation is fifteen. In this case they formed a chain of lentil-sized ulcers on the inner surface of the prepuce and furrow at the site of a previous balano-posthitis. Laillier[1] noticed nineteen syphilitic sores in a case where the patient indulged in sexual intercourse the evening after having been subjected to inunction of the penis and scrotum for the cure of scabies. Keyes,[2] again, relates the case of a woman who suckled a syphilitic infant and contracted eight primary syphilitic sores on the right areola and four on the left areola. According to Fournier[3] plurality is more frequent in women than in men. In 203 cases of initial lesion in females it was single in only 134, while in 556 males it was single in 402.

Seat.—The initial lesion has been found on all parts of the surface of the body; most frequently, of course, on those oftenest brought in close contact with other individuals, and in regions where the epithelium is delicate, and therefore most liable to be torn or abraded.

The genitals far precede all other parts in frequency of inoculation. Of 472 cases of initial lesion *in men*, Fournier[4] found 314 on the prepuce and glans; 60 on the sheath of the penis; 32 on the meatus; and 17 within the urethra; 12 on the lips; 6 on the arms; and the remainder on other parts of the body. Clerc,[5] also, of 403 local manifestations with general disease, found 234 on the inner aspect of the prepuce and furrow behind the glans; 58 on the sheath of the penis; 33 at the meatus; and the remainder on various parts of the body.

Of 150 cases seen by myself at the Lock Hospital in 1869, there were 41 initial lesions of the furrow, 31 of the inner prepuce, 24 of the outer prepuce, 17 of the frænum, 15 at the free border of the prepuce, 12 on the glans penis, and 10 at the urethral meatus.—B. H.

In the urethra the initial lesion has been found at a considerable distance from the orifice. Fournier has found it *post mortem*, and Hyde[6] during life in the fossa navicularis. We have observed

[1] Laillier, quoted by Jullien: Maladies Vénériennes. 1879, p. 506.
[2] Keyes: Archives of Dermatology, vol. iv. No. 2, p. 126.
[3] Fournier: Syphilis chez la Femme, p. 75.
[4] Fournier: Leçons sur le Chancre, p. 364.
[5] Clerc: Maladies Vénériennes, p. 97. 1866.
[6] J. N. Hyde: Chicago Medical Journal and Examiner. August, 1880, p. 116.

it at one inch and an eighth from the meatus. Keyes[1] discovered an initial lesion, by means of the endoscope, one inch and a quarter along the canal.

In 1877 there was under our care at the Male Lock Hospital, a man whose only sign of initial lesion was induration of the corpus spongiosum. When first seen there was general induration of the whole penile urethra. Under the influence of mercury this hardness gradually subsided, but after three weeks' treatment there still remained induration of the terminal inch of the urethra, and also a hard nodule three inches from the meatus. Fifteen weeks after the commencement of treatment the nodule had disappeared and only slight hardness of the urethra remained. This induration was followed by well-marked multiple enlargement of the inguinal glands, and also of the cervical and suboccipital glands. Mucous patches of the fauces and tongue subsequently appeared.

In women, of 113 cases of primary syphilis, Clerc[2] found the initial lesion 29 times on the nymphæ; 25 times on the labia majora; 16 times at the fourchette; and 43 times on various other parts of the body. Fournier[3] observed the particular part of the female genital organs occupied by the initial lesion in 249 cases: labia majora 114; labia minora 55; fourchette 38; cervix uteri 13; on or about the clitoris 10; entry of vagina 9; meatus or urethra 7; superior commissure 2; vaginal wall 1 (doubtful).

The initial lesion, when situated on the *cervix uteri*, which is in our experience an extremely rare occurrence,[4] is usually single; it sometimes involves the os, but may be limited to one or other lip. The surface of the sore is grey and tolerably even, surrounded by a red margin. It does not cause pain, nor give any sign of its presence, and consequently has every chance of being overlooked. The inguinal glands are generally unaffected. The whole cervix may be hypertrophied and hard, or it may be only partially indurated. A distinctive peculiarity is the pearl-like whiteness shown by the indurated cervix when pressed. Another important feature is stated by Fournier[5] to be the rapidity with which the sore heals and disappears without treatment, a few days being sufficient to change its aspect to that of a simple erosion. The same author thinks the characteristic just mentioned accounts for this form of primary lesion having been so long considered to be of extreme rarity.

On the wall of the vagina beyond the entry we have never seen the

[1] Keyes: Amer. Journ. of Syph. and Dermatology. 1870, p. 37.
[2] Clerc: Loc. cit., p. 100.
[3] Fournier: Syphilis chez la Femme, p. 60.
[4] Rasumow ("Zur Statistik der Schanker der Vaginalportion." Viertelj. f. Derm. ü. Syph., 1880, p. 517), found the initial lesion on the cervix uteri in 13 of 1374 cases of venereal sores of the female genitals.
[5] Fournier: Syphilis chez la Femme, p. 162. See also Schwartz: Annales de Derm. et de Syph., tom. vi. 1874–5, p. 51.

initial lesion. Fournier[1] has noted a single doubtful example. Cornil[2] suggests that the absence of initial sores from this portion of the vaginal mucous membrane may be due to the fact that it is covered by several thick layers of epithelium, and more especially because, as he maintains, its surface is destitute of glandular orifices.

The seat of the initial lesion when situated elsewhere than on the genital organs has already been indicated to some extent in the description of 'Modes of Contagion' in the preceding chapter. The lips, being easily excoriated and frequently exposed to contagion during the act of kissing, are common points for the entrance of the poison. The nipple too, in women suckling syphilitic infants, is often the seat of inoculation; while in accoucheurs the finger is not infrequently the point of contagion. Besides these not very uncommon sites of inoculation cases are continually being published of the occurrence of the initial lesion in the most diverse positions:[3] —*e.g.*, the cheek, eyelid, conjunctiva, ear, tongue, palate, chin, gum, nose, neck, thigh, anus, navel, &c. Mackenzie[4] states that he has met with seven cases of primary sore of the tonsils; and Nettleship[5] has recorded a case where the initial lesion was situated within the nostril. In the rectum Ricord[6] has observed it as high as the internal sphincter.

The initial lesion is, according to French authorities, much more frequently extra-genital in women than in men. Fournier gives the proportion of extra-genital sores as about 16 per cent. in women, and 6 per cent. in men.

Induration.—The degree of hardening of the area immediately around the point of contagion varies according to its situation and according to the individual, but is very rarely wholly absent. Induration is generally more abundantly developed in the skin than in the mucous membrane; and in its typical and most easily recognised form appears as a circumscribed nodule which, when taken between the finger and thumb, feels hard and slightly elastic like a piece of cartilage. Now and then the induration is confined to one or two sebaceous follicles, which then feel like small beads set in the skin.

[1] Fournier: Loc. cit. p. 72.

[2] Cornil: Loc. cit. p. 68.

[3] See Fournier: Leçons sur le Chancre, and Annales de Derm. et de Syph., t. viii. p. 64. F. Mason: St. Thomas' Hosp. Reports, 1873, p. 163. Proceedings of the Medical Society, vol. i. p. 174; vol. ii. p. 7; vol. iii. p. 190. Sturgis: Amer. Jour. of the Med. Sci., 1873, p. 102. Henry: Amer. Journal of Syph. and Derm., 1874, p. 353. Hulot: Annales de Derm. et de Syph., t. x. p. 29. Boucheron: L'Union Médicale, April 1, 1879. Roddick: Canada Med. and Surg. Jour. 1880, June, p. 485; and many others.

[4] Morell Mackenzie: Medical Examiner. Aug. 29, 1878, p. 123. See also Hulot, loc. cit.

[5] Nettleship: Brit. Med. Journal. 1875, vol. ii., p. 363.

[6] Ricord: Clinique Iconographique de l'Hôpital des Vénériens. 1851, obs. xiii. bis, p. 3.

Not infrequently also the induration is spread in a thin superficial layer beneath the sore; to this form the term '*parchment induration*' has been applied by Ricord, because the base of the sore, when taken horizontally between the fingers, feels as though a layer of parchment were inserted beneath it. In a still less accentuated form this layer feels only like a sheet of thin writing-paper, and in this case it may be easily overlooked unless care be taken in the examination. Between the nodular and the parchment varieties, all degrees of induration are met with, and the aspect of the initial lesion will, to a considerable extent, depend upon the greater or less development of this new product.

When the nodular form is present there is generally no difficulty in recognising the true nature of the affection, but the parchment or paper varieties are not always so easily appreciable. A favourite seat of parchment induration is the sheath of the penis, and here also the initial lesion is frequently covered by a scab. Venereal sores of the sheath are nearly always syphilitic. At the *meatus urinarius*, when both lips are indurated, the orifice often assumes a peculiar funnel-shaped appearance. On the *glans penis* induration is sometimes ill-marked.

Induration has been supposed by some observers to be frequently absent in women. In the parts about the entry of the vagina, it is true, hardness is often ill-marked or with difficulty appreciable; but, as Fournier has pointed out, this is just the locality where the natural conformation of the parts renders a thorough examination of the base of the sore exceedingly difficult. In other situations induration is as well marked as it is in men.

When the initial manifestation is on the *lip*, induration is usually abundant. About the *nipple and areola*, as well as in other parts, the initial lesion sometimes appears as a simple crack or fissure with hard edges, and from its innocent appearance is frequently overlooked. On the *fingers* the initial lesion is often fissure-like with considerable swelling around it. Now and then it takes the shape of a patch of prominent granulation tissue, and induration is usually not very distinct. The principal features of the sore, when situated on the finger, are its painfulness, and resistance to ordinary local treatment. About the *anus* the initial lesion may be situated at the margin or may involve the anal orifice. When seated among the radiating folds it often appears as a simple elongated fissure, which may easily escape notice without a careful examination. If not kept very clean, the anal sore often becomes inflamed, leading to intertrigo and swelling. When involving the orifice, the lesion is most frequently at the anterior part of the anus. Here it is very liable to become excoriated and inflamed from irritation caused by the

passage of the fæces, and induration may be very difficult to make out.

The limits of the indurated area, when no complication is present, are always sharply defined, differing in this respect from the thickening produced by inflammatory action, which has no marked line of separation between the healthy and diseased parts, but fades away gradually into the surrounding tissues. The blanching which all the varieties of syphilitic induration undergo when pressed is peculiar: the indurated area loses its colour much more readily than the healthy skin.

When the induration has developed to a certain extent, it disintegrates by degeneration of its component parts; this process, when free from irritation and congestion, forms the ulceration which generally takes place on the surface of the papule.

The course of the initial manifestation is slow. After an interval of ulceration or desquamation, it subsides, shrivels, and disappears, leaving generally a cicatrix, sometimes no more than a stain in the skin which, also, after a while, may be wholly lost. The scar is commonly well-marked in some localities, such as the skin, the sheath of the penis, and the lip. In these situations the scar is sometimes white, depressed, and tougher than the neighbouring healthy surface.

There are occasionally seen some peculiarities or variations in the development and disintegration of the induration tissue that are worthy of notice. In the first place, the indurated tissue which remains after the primary sore has healed, may ulcerate a second time, and lay open as a ragged indolent sore, the mass of hardened tissue which occupies the site of the original initial lesion. This process may occur, according to Fournier[1] who has minutely described the phenomenon, during a period ranging between a few days and several weeks after the first healing of the sore.

Fournier describes also a process of disintegration of the induration tissue which resembles the change by which a gumma breaks down: the induration tissue when very copious, and situated at the glando-preputial furrow may, though this is a rare occurrence, soften in its interior instead of ulcerating on its surface, and the liquified contents then escape through minute orifices at several points.

Again a variation from the customary course. Along the furrow behind the glans penis, masses of induration sometimes form near the original hard sore, but quite distinct from it, and subsequent to it in point of time, but before the appearance of the general rash.

[1] Fournier: Archives Générales de Médecine. Nov., 1867, p. 513.

These masses do not ulcerate deeply, but they may be excoriated on the surface. Ultimately, they disappear and leave no trace. In our experience they are rare phenomena. Fournier terms them '*indurations satellites*.' Zeissl[1] alludes to their occasional appearance and calls them 'accessory indurations.' But while mentioning the occurrence of these peculiarities in connection with the indurated initial lesion, we must not omit to point out that mucous patches, and even dry papules of the secondary eruptions, may, especially on the female genitals, develope hard bases and ulcerate on their surface; and thus so closely resemble the initial lesion that they can be distinguished from it only by the history of the case and by the presence of other symptoms of syphilis belonging to a more advanced stage of the disease.

Induration sometimes recurs at the site of the initial lesion; but the new production does not always ulcerate. This repetition may take place a few months after the first disappearance of the induration, or it may not occur until long afterwards. Hutchinson[2] states that it may happen many years after the first infection, founding his belief on the fact that the site of the primary sore is always the exact site of the repetition of the induration. It may disappear also spontaneously. We have noted this repetition four years after the departure of the original induration. Such late developments are difficult to distinguish from gummata. The fact that induration may recur at the site of the original initial lesion without any second inoculation of the syphilitic virus is also of practical importance with regard to the diagnosis of second attacks of syphilis; indeed it is probable that these cases of recurrent induration have been in some instances recorded as examples of reinfection.

The length of time during which the induration lasts is given very variously by different authors. Probably its most common duration is about two months. Cornil[3] assigns for the induration in women, a stay of three or four weeks, but acknowledges that it often continues for several months, and exceptionally for five or six years. Puche[4] also states that it may continue for nine years, and others assign even longer periods. Zeissl[5] found the duration to be never less than ninety days in his cases. As an instance of rapid departure, Clerc[6] mentions a case where all trace of the hard sore was lost in twelve days after it first appeared. We also have watched the disappearance of a well-marked papular eroded initial lesion, as large as half a

[1] Zeissl: Lehrbuch der Syphilis. 1872, p. 56.
[2] Hutchinson: Discussion on Syphilis. Path. Trans. 1876, p. 349.
[3] Cornil: Leçons sur la Syphilis. 1879, p. 65.
[4] Puche: Ricord's Leçons sur le Chancre, by Fournier, p. 148.
[5] Zeissl: Lehrbuch. 1872, p. 55.
[6] Clerc: Loc. cit., p. 83.

horse-bean, in seventeen days after it first came under notice, which was certainly during the first week of its development.

Histological structure of the initial lesion.—According to Cornil[1] a hard sore consists of a circumscribed thickening of the skin, the epidermic and dermo-papillary layers being concerned in the change. The superficial epidermis or horny layer still remains at the edges of the sore, but it is lost or much thinned at the centre. The Malpighian layer which is much thickened at the margins, is still partly retained at the centre when that is only excoriated, but it may be quite cleared away when the ulceration is deep. Under the microscope the excoriated or ulcerated surface is generally defined by a line passing evenly and without break from the centre to the borders. If the Malpighian layer is wanting at any part, it is replaced by the viscid false membrane so characteristic of the initial sore, and which is composed of a scanty liquid containing lymphatic cells, and epidermic cells of the horny and mucous layers. Lastly, the walls of the arteries and veins are hardened and thickened, and their lumen is sometimes obstructed. At the same time the connective tissue is infiltrated by more or less atrophied lymphatic cells. The bundles of the connective-tissue fibres are generally not separated nor destroyed; indeed they form the fibrous framework which, with the hardened vessels, gives to the syphilitic primary sore its special character of induration.

Absence of induration.—It must be borne in mind that induration of the primary manifestation is only one symptom of syphilis, and therefore may vary in intensity or be absent like any other symptom of the disease. Luckily for the diagnosis it very rarely indeed is wanting. Most authorities agree that such want of development is sometimes met with; others again, searching for it carefully, have always found it. Clerc,[2] who believes in the occasional absence of induration, in two years and a half met with ten cases of early syphilis where he could find no primary manifestation whatever; but, as already mentioned, he also records a case where induration disappeared completely in twelve days. The exceptions are so few that, practically, induration is constantly formed at the point of contagion. Bassereau,[3] in 170 cases of syphilitic initial manifestation, found 157 plainly indurated; in 13 induration was doubtful; but he did not pretend to say that it had been absent throughout from any of them. Before declaring indura-

[1] Cornil: Loc. cit., p. 19, *et seq.* See also Auspitz and Unna: Vierteljahr. für Derm. u. Syphilis, 1877, p. 161.

[2] Clerc: Loc. cit., pp. 78, 93. See also Lane: Lectures on Syphilis. 1878, p. 20. Cullerier: Précis Iconographique, p. 236. Fournier: Sur la Syphilis chez la Femme. 1873, p. 129. Cornil: Loc. cit., p. 65.

[3] Bassereau: Loc. cit., p. 130.

tion of an initial sore to be wanting, it should be borne in mind th in some situations—the entry to the vagina, the cervix uteri, and t anus for example—it is difficult to get hold of the sore in such mann as to be able to test satisfactorily the presence or absence of induratio

Indolent Enlargement of the Lymphatic Glands Communicatin with the Infected Locality.—(Indolent bubo, chronic adenopathy multiple glandular enlargement, *Pleiade ganglionnaire.*) This symp tom comes next after the appearance of the initial lesion, and is most important one for the diagnosis when the characters of the com mencing papule do not decide whether syphilis is present. The glands begin to alter shortly[1] after induration commences at the point of contagion. In the cases of artificial inoculation where the changes were closely observed, ten or eleven days[2] elapsed before the glands were sufficiently enlarged to be recognised. They continue to increase slowly until they have doubled their original size. The gland which is nearest to the point of contagion begins the enlargement, and attains a greater size than the others. No pain accompanies this swelling, or at most only passing tenderness which soon ceases. The skin retains its natural colour and suppleness because it is not implicated in the changes going on in the glands beneath, and there is complete absence of inflammatory action. The glands do not form a conglomerate mass, but each gland is distinctly and separately enlarged. The anatomical alteration consists in increase of the lymphatic cells, and irregular hypertrophy of the cellular tissue that composes the framework of the gland. On section the gland is firm, dense, and pale, unless very recently enlarged, when it has a pinkish hue. The surrounding cellular tissue is unaltered.

The enlargement of the glands at this period of the disease is usually limited to those of the two or three consecutive groups connected with the seat of contagion. For instance, in the groin, the large superficial gland lying near the centre is commonly the first to swell and the most affected; next come those lying outwards on the fold of the groin; after them those placed below and to the inner side of the first gland grow big; and in cases of extreme development of the affection, the deeper glands can be felt in the abdomen along the iliac vessels. Fournier[3] has preserved preparations taken post mortem, where the glands were enlarged in one case for two inches above the crural arch. Horteloup[4] is of opinion that the iliac glands

[1] Auspitz says usually seven days. Archiv für Dermat. u. Syph. 1873, S. 460.

[2] Fournier: Incubation de la Syphilis, p. 20; Follin: Pathologie externe, vol. i., p. 736; Zeissl: Loc. cit., S. 51; Bärensprung: Annalen des Charité Krankenhauses. Bd. ix. 1tes heft.

[3] Fournier: Syphilis chez la Femme. 1873, p. 213.

[4] Horteloup: Annales de Dermatologie et de Syphiligraphie, vol. ix., p. 20.

are nearly always enlarged in young strumous persons when those of the groin are affected.

At the post-mortem examination of a young man who was crushed by a railway van, I found an initial sore on the inner surface of the foreskin on the right side as large as a horse-bean, and the lymphatic glands of the right groin severally enlarged; some to the size of large almonds, others of lesser size. This general enlargement passed beyond the iliac vessels to the side of the aorta for a short distance above its termination. In the left groin the glands were less affected, but the multiple enlargement extended as far as the division of the common iliac artery. The skin and throat of this patient were free of syphilides, and the cervical and axillary glands were not of unusual size. The body was fairly well nourished and the viscera were healthy.—B. H.

The glands which enlarge consecutively to the development of the initial lesion on the genital organs are usually those of both groins. But in some patients the glands of one groin only are affected, and that not necessarily of the side of the body on which the initial sore is placed. This anomaly has been explained by Curnow[1] to be due to the anatomical arrangement of the lymphatic ducts of the penis. Generally these are collected into one or two main trunks which run along the dorsum penis and send branches to both groins, but sometimes there is only a single trunk which travels to one or other groin.

The particular glands which enlarge will of course depend on the position of the initial lesion. When that is situated on the genital organs, lower abdomen, thighs, perinæum, buttocks, or anus, the inguinal glands are first affected. Occasionally, however, the femoral group begins the enlargement; this is explained by the fact that the lymphatics of the penis sometimes end in these instead of in the inguinal glands. Again when the lips or the lower part of the face bear the sore, the glands under the jaw and near the angle are those enlarged. When the eye-lids or upper part of the cheek or ear are inoculated, the pre-auricular gland is affected. If the tongue be the site of the initial lesion, the glands just above the hyoid bone swell. Sores on the upper extremity and breast are followed by swelling of the axillary glands. The epitrochlear glands enlarge when the sore is situate on one of the three inner fingers, but usually escape when the thumb or forefinger is inoculated.

In some of the regions just enumerated, there is usually only one gland instead of a group. In such cases the enlarged gland is perforce solitary. But furthermore, in localities in which the glands are numerous, the groin for example, multiple enlargement, though *nearly* always present, is not invariably so. We have seen cases where one gland only in each groin swelled sufficiently

[1] Curnow: Lectures on The Lymphatic System, &c. Lancet, April, 1879.

to be perceptible to the finger. Curnow points out that the number of glands varies in different persons, several being sometimes fused together instead of being isolated. Two other causes have come under our observation that help to limit the enlargement. One is, that the patient by previous inflammation or suppurative bubo has lost several glands which have degenerated into fibr fatty masses. In other cases the patient suffers from inguin hernia, and wears a truss of which the continuous pressure seem to cause absorption of the glands, or at least prevents their enlarge ment from syphilitic irritation. Such are the circumstances which without thoroughly elucidating the causes of partial or one-side enlargement assist in throwing light on the question.

Duration of the enlargement of the lymphatic glands. This varies much. Most commonly the enlargement continues for three or four months without sign of diminution. Then shrinkage slowly begins, and in the course of ten or twelve months the glands have regained their normal size. Not unfrequently they dwindle through fatty degeneration, which occasionally terminates in calcification. Some authors assign a much longer duration. Heron Watson[1] reported that in cases under his observation treated without mercury, the enlarged glands did not shrink to their natural size until two years had passed away.

I noted the condition of the inguinal glands in thirteen male patients at the Lock Hospital. Three of these, who had been infected eighteen months, two years, and six years respectively, showed no enlargement. In six patients, infected between one year and two years, and who had undergone more or less prolonged treatment, the glands were still enlarged; and in one patient they remained enlarged five years after infection and in spite of two years' continuous treatment. In the remaining three cases, in which syphilis had been contracted within six months, the glands were subsiding under mercury.—A. C.

Suppuration of the enlarged glands occurs now and then, but probably never through the influence of syphilis alone. Among the patients at the Lock Hospital it is very common to find suppurating buboes present with syphilis, but in those cases the initial lesion has also become a freely suppurating sore, either through dirt and irritation or from the presence of a local ulcer as well. In young, weakly, or strumous persons, after violent exercise or fatigue, abscess may form as it does when syphilis is not present. The gland which enlarges first is usually that which suppurates, but the pus it secretes is not inoculable, for the bubo is sympathetic and never virulent. In 1400 cases of venereal disease, Mr. Henry Lee[2] found

[1] Heron Watson: Evidence before the Venereal Committee at the Admiralty. 1865. Q. 4671.

[2] Henry Lee: Medical Association Journal, Dec. 7, 1865.

ninety-eight of secondary symptoms with suppuration of the inguinal glands. Still, in all but six of these, some cause presumably distinct from syphilis occasioned the suppuration. At the Midi Hospital in the whole year 1856, there were in Ricord's [1] wards only three cases of suppuration of the glands accompanying constitutional syphilis, and they were scrofulous patients. Bassereau [2] gives 380 cases of constitutional syphilis where he noted the condition of the glands. Of these, nineteen had suppurating buboes, and 323 had general enlargement. Of 204 females observed by Fournier,[3] five had suppuration of the glands. Of 116 cases treated by us at the Male Lock Hospital, ten had acute suppuration of their enlarged inguinal glands.

So-called strumous degeneration of the lymphatic glands.—Occasionally in persons of scrofulous or lymphatic temperament, where signs of constitutional debility are present, the glands, having enlarged separately, soon coalesce, soften, and grow painful. The cellular tissue around them thickens, the skin becomes brawny, adherent, and dull red in colour. Slow suppuration begins at several points in the cellular tissue about the glands; this process gradually destroys a considerable portion of the skin and cellular tissue, while the glands themselves degenerate or even slough away altogether.

Enlarged glands are always present in syphilis.—Ricord asserts that they are all but a necessary phenomenon. Bumstead does not know of an exception. Sigmund believes them to be the only unfailing pathognomonic sign of syphilitic infection. On the other hand, Clerc says that in a very few persons the lymphatic glands undergo no alteration at any period of the disease; he says, moreover, that the glands are most enlarged where the primary manifestation approaches the typical papular form, and are least developed when induration is ill-marked at the point of contagion. Of 265 cases observed by Fournier,[4] enlarged glands were found in all but five, and of those five patients two were too fat to allow of a proper examination, while in a third the initial lesion was phagedænic. Fournier states that he has several times noticed the absence of glandular enlargement with phagedænic initial sore. This has been also remarked by Ricord. Vidal [5] has only twice seen the multiple enlargement wanting—both times in pregnant women. We have ourselves noted a few cases where through the early stages of the disease, the lymphatic glands of the groin were

[1] Fournier: Leçons sur le Chancre, p. 157.
[2] Bassereau: Loc. cit., pp. 147, 301, 378, 398, 445.
[3] Fournier: Syphilis chez la Femme, p. 222.
[4] Fournier: Ibid. p. 200.
[5] Vidal (Emile): Gazette des Hôpitaux. 1879, Oct. 23.

unchanged. Bassereau, in his 380 cases, found that in 35 the glands were not enlarged at the time of observation, while the amount of enlargement varied much in those where it was present.

Indolent enlargement of the lymphatic vessels.—The lymphatics which lead from the sore to the nearest glands are in some patients distinctly enlarged. In this state they form painless cords the size of a crowquill, and freely movable under the skin. When there are two main ducts along the dorsum penis, both may be thickened and two cords are then felt. The cord becomes perceptible about one inch behind the glans, and reaches nearly to the mons Veneris, where it is lost in the loose fat of the part. In one instance which came under our notice, where the site of the infection was the thumb, the lymphatic ducts could be felt at the front of the elbow and along the inner side of the biceps as high as the fold of the axilla.[1] Horteloup[2] says the lymphangitis becomes perceptible some days after the induration of the initial lesion and sometimes persists after its cure, but if the initial lesion is not irritated, the induration of the lymphatics disappears more rapidly than that of the primary sore. This change in the vessels occurs frequently in syphilis. Rollet says once in every five cases. This estimate we believe to be a low one, and are inclined to think that it is more often present than absent. The enlargement of the lymphatic vessel is usually regular, but occasionally it has small roundish swellings along its course. The swelling is due to thickening of the walls of the vessels by proliferation of the cellular elements, and invasion or multiplication of leucocytes.

Besides this easily detected thickening of the larger lymphatics, the cellular tissue of the foreskin, sheath and pubes as far as the fold of the groin and the scrotum, is sometimes affected by a brawny swelling, only slightly tender and never advancing to abscess or sloughing. The skin is usually of natural hue and not reddened, though it may be dusky in tint. When the affection is well marked, the parts enlarge to twice or thrice their natural size. Occasionally the swelling is limited to a small area, as the foreskin alone, or the lower half of the sheath of the penis. The limitation is abrupt and well defined, the finger passing at once from the normal, to the thickened brawny tissue. In women, the parts corresponding to those attacked in men are affected, namely, the prepuce of the clitoris, the mons Veneris, the labia, and the nymphæ. The nature of this affection is not well understood, but it is considered by some observers to depend on thickening of the

[1] Fournier describes a similar case. Loc. cit. p. 231.
[2] Horteloup: Loc. cit.

walls of the capillary lymphatic vessels. This peculiar œdema disappears in a few weeks.

Diagnosis of the Initial Manifestation.—This is made in ordinary cases by the presence of the four following characters:—First: the period of incubation—usually about twenty-four days—before induration begins at the point of contagion. Second: the presence of induration. Third: the superficial indolent character of the ulceration. Lastly and most distinctive: the painless general enlargement of the nearest group of lymphatic glands. The discharge is normally viscid, adherent, and scanty, quite unlike the secretion of local ulcers; but if a syphilitic ulcer be made to suppurate, its discharge is then as purulent as that of the local sore.

The primary syphilitic ulcer is liable to be confounded with simple chancre, herpes, excoriations and chafings, warts, epithelial cancer, and, when covered by a scab, with ecthymatous or other non-venereal affections, such as eruptions due to pediculi and itch. The distinctions between *simple chancre* and the syphilitic sore are given in the chapter on Chancre, and need not be recapitulated here. *Herpes* is distinguished, if it be seen in its early state, by a group of vesicles; otherwise by acute inflammation of an itching area and copious secretion, but the irritation of herpes subsides in a few days if suitable local treatment be adopted. Similar management brings the same result also in excoriations; these moreover show themselves in a few hours after the chafing that occasioned them. None of these affections have the induration, the viscid discharge, nor the enlarged glands of the syphilitic ulcer. In such cases, nevertheless, whenever risk of exposure to syphilis has occurred, a positive opinion must be reserved until sufficient time for the incubation of syphilis has passed. *A furuncular affection* of the glans penis or balano-preputial furrow has been described by Mauriac,[1] who states that induration may in these very rare cases be as well marked as in the true initial lesion of syphilis. The inguinal glands however remain free, which fact, together with the absence of any signs or history of syphilis, would suffice for the diagnosis, at any rate after a time. We have never seen this affection. In the lower class of prostitutes, who have been suffering with syphilis for years, tough indurated cicatrices are common at the entry of the vagina, and they sometimes closely resemble the indurated initial sore of syphilis when irritated by neglect.

Epithelial cancers are sometimes mistaken for syphilitic sores. They are distinguished in their early stages by their margins being raised into prominent tubercles, and by being cracked and fissured;

[1] Mauriac: Ulcerations non-virulentes des Organes Génitaux. Paris, 1878.

and also by the neighbouring glands not being enlarged, for these remain long unaffected unless the cancer progress rapidly, in which case the disease is not likely to be mistaken for an indurated sore. If the sore has existed a few weeks, other symptoms, such as general eruption, will be present if the ulcer be of syphilitic origin. Induration of the syphilitic ulcer can by no means be trusted alone, for epithelial growths frequently extend into the surrounding tissue and closely simulate syphilitic induration. Epithelial growths are most often taken for syphilis when placed on the glans penis vulva, where they are far less common than syphilitic ulcers; the other hand, a syphilitic initial lesion is more frequently mistak for cancer when situated on the lower lip, where it is comparative rare and cancer common; but attention to the distinctions just give usually renders the diagnosis clear, especially in the case of a syphilit induration of the lower lip, which is early accompanied by enlarge submaxillary lymphatic glands.

Patches of the general eruption of syphilis in certain localities, ar sometimes mistaken for initial ulcers. Papular eruptions an mucous patches of the genital organs occasionally indurate, and i neglected even ulcerate, thus resembling the initial lesion closely On the other hand, the initial lesion may become gradually altered in character so as to assume the appearance of a papule of the secondary eruption or of a mucous tubercle. Fournier says this transformation may also happen by the formation of small papules around the initial lesion, with which subsequently the papules coalesce, and thus form a single patch. These changes are most frequent in women.

Gummy deposits in advanced syphilis, when occurring on the glans penis, or other parts of the pudenda of both sexes, after breaking on the surface, often disintegrate, and thus acquire very much the aspect of a sloughing initial lesion. They are distinguished by the unenlarged condition of the glands, by the absence of local congestion, and by the presence or traces of syphilitic disease elsewhere. The presence of old scars of rupia, nodes, and the peculiar pallor that often attends long-standing syphilis, also help the diagnosis. An ulcerated gumma of the tongue is also sometimes mistaken for the initial lesion, as actually occurred with the following typical example of gumma:—

A woman, married some years, who gave no history of general syphilis, but had a very distinctly syphilitic complexion, stated that she had been treated with mercury for two months, though without benefit, before she came under my care. When I saw her I found an ulcer on the right side of the tongue near the tip. t was not elevated above the surface in the least, but formed a ragged cavity in the muscular substance, with some thickening and hardness around it. The

patient said that it had existed as a hard lump in the tongue for some months before it burst; some matter then escaped, and the hole had remained open ever since. She recollected, moreover, that for the last two years she had had lumps in the tongue not exactly where this one was, and that one burst leaving a sore, which was very painful when she had hot or sharp-tasting food in her mouth. No other symptom of syphilis had been observed; but though she had been married eight years she had no children. The earthy pallor of the face and soft palate was very distinct. This circumstance, with the history of the nodules in the tongue, induced me to diagnose them as gummy swellings of the muscular substance. She took iodide of potassium and in six weeks the cavity healed, and the thickening almost entirely disappeared.—B. H.

The diagnosis concerning syphilis must be uncertain when the patient is ignorant of the date of infection, and has a recent sore which suppurates, and no multiple enlargement of the neighbouring glands. In this case a positive opinion cannot be expressed until the ordinary incubation period of syphilis is passed, and time allowed for the induration to develope, should that disease have been inoculated.

Comparison of Venereal Ulcers with their Source.—When an immediate diagnosis is necessary, and the signs which the patient presents on his own body are insufficient for the purpose, an examination of the person from whom the sore was contracted (confrontation), sometimes gives valuable information as to the true nature of the affection; but only under certain conditions: that is to say, the patient must not have had intercourse during a given time with any other person than the one suspected, and also, the inspection of the source of contagion must take place within a recent period, otherwise the manifestations—especially in women—may have had time to disappear.

Inoculation of the discharge of the sore on the bearer (auto-inoculation) was at one time upheld by Ricord as an unerring test for the simple chancre and for the syphilitic sore. The simple ulcer is easily reproduced by inoculation, but the thin discharge of the syphilitic initial manifestation fails to produce a sore when inoculated on its bearer. This distinction is now known to be untrustworthy for two reasons: first, the syphilitic virus may be present in a patient who suffers from local ulcers also, and the pus of these ulcers might be inoculable, notwithstanding the presence of general syphilis; secondly, though the thin discharge of the initial lesion of syphilis is not inoculable on the bearer, still, if the lesion be made to suppurate by any kind of irritation, the pus from the irritated sore sometimes becomes inoculable. Thus Ricord's test is not always to be relied upon in the diagnosis of venereal sores. Auto-inoculation is, however, of value, in some other ways which will be considered hereafter.

To recapitulate the characters of the syphilitic ulcer:—They

are, 1. The smooth surface secreting a scanty viscid secretion. 2. The sloping edges. 3. If induration be marked at the base of the ulcer, it is also evident in the neighbouring lymphatic glands. 4. In six to twelve weeks after infection, other symptoms of syphilis, papular eruption, sore throat, pallor, and other signs appear.

The *prognosis* of the initial lesion is that of syphilis, and the patient must expect further development of the disease.

CHAPTER IV.

AFFECTIONS OF THE SKIN.

Period preliminary to the Stage of general Eruption.—When the initial lesion and the enlarged glands have developed, an interval commonly ensues before further phenomena of the disease appear. This interval has been termed the 'second incubation' to distinguish it from the 'primary incubation' or period which intervenes between contagion and the appearance of the initial manifestation. Counting then from the first appearance of the initial lesion to the first appearance of the general eruption, this second period of incubation may be usually reckoned to occupy between five and seven weeks. Lancereaux[1] assigns, on the authority of MacCarthy, forty or fifty days as the average. Diday,[2] calculating from fifty-two cases observed among his private patients who were treated without mercury, found that in thirty-eight patients the interval between the appearance of the sore and that of the rash ranged between thirty-five and fifty days. The rash appeared in one case only twenty-five days after the sore, and in another was delayed till one hundred and five days had passed by. The average length in the fifty-two cases was forty-six days. Still more recently[3] Diday has published two cases where a long delay, 120 and 160 days respectively, intervened between the appearance of the sore and the outbreak of the general eruption in patients who were suffering, one from typhoid fever, the other from inflammation of the lungs. Fournier[4] gives the average length of the second incubation as forty-five days. Profeta[5] draws a distinction between the sources of con-

[1] Lancereaux: Loc. cit., p. 100.
[2] Diday: Exposition critique des nouvelles doctrines sur la Syphilis. 1858, p. 266. And Thérapeutique des Maladies Vénériennes, &c. 1876, p. 235.
[3] Diday: Annales de Dermatologie et de Syphiligraphie. Jan., 1880, p. 44.
[4] Fournier: Syph. chez la Femme. 1873, p. 305.
[5] Profeta: Lo Sperimentale. March, 1874.

tagion. According to this observer, if the contagion come from a secondary affection, the interval is about forty days; but if from an initial lesion the period ranges between thirty-five and seventy days. Bassereau[1] collected one hundred and seven cases and found the usual interval to be fifty days; in only one case did he mark a delay of great length; in this it was five months.

Others measure the time at which the eruption appears from the day of contagion. Zeissl[2] has never seen less than eight weeks elapse. Sigmund[3] limits the length of the interval between inoculation and the outbreak of the skin eruption to six or eight weeks. Ricord[4] sets the extreme of delay at six months.

As instances of rapid evolution, the following may be mentioned. R. W. Taylor[5] has recorded a case where forty-two days only intervened between the day of contagion and the exanthematous eruption. Güntz[6] states that he noted a case where twenty-five days after infection a prodromal fever appeared, and was followed two days later by roseola. He reserves the publication of the particulars of this case.

In a medical practitioner treated by me, only 46 days elapsed between the inoculation of the finger and the appearance of the general roseola.

In ten other cases where the date of infection could be settled with probable exactness, the interval between contagion and eruption was eight weeks in one case, the shortest, and fifteen weeks in another, the longest.—B. H.

It may be concluded, then, that the first general eruption of the skin usually occurs between sixty and seventy days after contagion, or between forty and fifty after the appearance of the initial lesion; and between thirty and forty after the enlargement of the neighbouring lymphatic glands.

Prodromata.—The appearance of the rash is frequently, though by no means invariably, preceded by symptoms of general disturbance of the system. These symptoms are far more frequent in women than in men. This is probably explained by the greater nervous excitability of the female sex. The patient becomes often rapidly anaemic, and suffers from the customary concomitants of that condition, namely, palpitation and shortness of breath, and occasionally epistaxis, while sometimes haemic murmurs may be detected. In addition, there may be headache towards evening, then malaise, languor, loss of appetite and sense of imminent illness, localised

[1] Bassereau: Traité des affections de la Peau symptomatiques de la Syphilis. 1852, p. 175.
[2] Zeissl: Lehrbuch. 1872, p. 77.
[3] Sigmund: Neuere Behandlungsweisen der Syphilis. 1880, p. 71.
[4] Ricord: Leçons sur le Chancre. 1860, p. 192; and also Lancet, vol. ii. 1872, p. 264.
[5] R. W. Taylor: Amer. Journ. of Syphilography and Dermatology. 1871, p. 244.
[6] Güntz: Das Syphilitische Fieber. 1873; in a footnote to p. 178.

pains in the head, ears, joints or muscles, short shivering fits and, but very rarely, morbid excitations of normal sensations such as inordinate appetite or thirst.

Ricord and Grassi[1] discovered that during the development of the hard sore and subsequent interval before the outbreak of the exanthem, the proportion of red corpuscles in the blood notably diminished while the proportion of albumen increased. Wilbouchewitch,[2] who examined a large number of patients with commencing syphilis, found that the proportion of red blood corpuscles was decidedly diminished. Keyes,[3] in further observations on the red blood corpuscles, with the object of determining the influence of mercury upon them, also found the number diminished below the healthy standard.

The occurrence of neuralgia was noted by MacCarthy[4] in forty out of sixty cases. In twenty-one of these there was nocturnal headache; in eleven headache and rheumatoid pain of the joints; in eight neuralgic pains of uncertain nature. Vajda[5] found that of one hundred and two cases of early syphilis specially examined by him, thirty-seven per cent. had neuralgic affections of some kind, headache being by far the most frequent form. The pain was sometimes referred to the region of the supra-orbital nerve, sometimes limited to one half of the head, and occasionally it was felt at the nucha. Next to headache came dulness and weariness, or weariness combined with tenderness of the muscles or subcutaneous osseous surfaces. Sleeplessness was noted only in two of the one hundred and two patients. Zambaco[6] gives remarkable instances where the prodromal neuralgia simulated nervous affections of various kinds. The headache is sometimes excruciating, and may even lead the patient to attempt suicide.

In the case of a previously healthy woman aged forty-seven, who lately came under my observation, severe headache had already lasted twenty-five days, and for three days had been so intense that the patient had to be forcibly restrained from injuring herself. The pain was always much worse at night, but never entirely absent. Under the impression that the case was one of malarial poisoning, quinine and other antiperiodics had been given in large doses, but without any good effect. A rash was stated to have appeared a few days after the onset of the headache. When I saw the patient a papulo-roseolar syphilide, mucous patches of the fauces, and enlarged glands were present. After three days' mercurial treatment the pain sensibly diminished, and disappeared entirely a week later.—A. C.

[1] Ricord : Leçons sur le Chancre. 1860, p. 189.
[2] Wilbouchewitch : Archives de Physiologie. par Brown Sequard et autres. 1874, p. 516.
[3] Keyes : Tonic Treatment of Syphilis. 1877, p. 24.
[4] MacCarthy : Thèse de Paris. 1844 ; quoted by Lancereaux, loc. cit., p. 104.
[5] Vajda : Vierteljahresschrift für Dermatologie u. Syphilis. 1875, p. 147.
[6] Zambaco : Maladies Nerveuses Syphilitiques. 1861.

At this period of the disease also, patients occasionally manifest sig of temporary insanity. Kiernan [1] records several cases where hallu nation and delusions occurred during the fever of secondary syphil

Syphilitic Fever.—In recent years the attention drawn Wunderlich [2] to elevation of temperature in various febrile affection has induced other observers to study the pyrexia of syphili Among those who have contributed most valuable essays ar Courteaux,[3] Fournier,[4] Güntz,[5] and Vajda.[6] Güntz was the earlies to publish observations of this kind. Our account owes most t the fully detailed description of Fournier, which contains nearly al that is said by the rest, while he has added much that they omit.

Rise of temperature is not infrequent during the earlier stages o syphilis; but it occurs more frequently in women than in men. Of 1120 syphilitic women admitted into the Lourcine Hospital, Fournier found that 351 presented febrile phenomena due to syphilis alone, all cases where the rise of temperature might have been due to other causes having been excluded. Güntz found that one in five of his syphilitic patients had pyrexia; while Courteaux sets the proportion at a little more than one in three.

The pyrexia of syphilis has two distinct varieties: the first is *prodromal* or *symptomatic*, that is, connected with the outbreak o the general eruption. It is more rare than the second variety, to be presently described. The type is that of continued fever, and the outburst sets in just before the appearance of the eruption. The duration is short, from twenty-four hours to two or three days, seldom longer than five (Güntz). The height is much affected by the form of the eruption, being greatest where the rash which succeeds it is widely spread and closely set. The range, as a rule, does not surpass 104° F. The morning and evening temperatures while the fever lasts seldom differ by more than two or three degrees. The acme of the fever is reached just when the eruption begins, and remains high during its development, but as soon as the rash is fully out it drops at once to the healthy range. The pulse seldom exceeds 120 according to Güntz.

Sometimes the temperature rises again with each fresh outbreak of eruption on the skin. An example of this kind is reported by

[1] Wunderlich: Medical Thermometry, New Sydenham Society. 1871, p. 405.
[2] Kiernan: Boston Med. and Surg. Journal. 1880, July 15.
[3] Courteaux: De la Fièvre Syphilitique. Thèse de Paris, 1871.
[4] Fournier: Syphilis chez la Femme. 1873, p. 846, *et seq.*
[5] Güntz: Das Syphilitische Fieber, Küchenmeisters Zeitschrift. 1863 and 1873.
[6] Vajda: Ueber das Syph. Fieber, &c. Vierteljahresschrift für Derm. u. Syphilis. 1875, p. 147. See also Bremer: Om febertilfolde for Syfilitisk Klin. Middel. fra Alm. Hosp. i Kjöbnhavn Nord. Med. Arkiv., xi. 4, No. 30. Janowsky: Präger Vierteljahresschrift für Med. Bd. I., S. 55, Bd. IV., S. 61. Report of Committee on temperature in Syphilis. Clin. Soc. Trans. 1870.

Krowczynski,[1] of Lemberg. The case was that of a woman aged thirty, who suffered very severely from a malignant form of syphilis with an early ulcerating skin eruption. The temperature rose on three separate occasions and was accompanied each time by shivering. The first elevation ushered in the roseola; the second a papular eruption; and the third an outbreak of vesicles and pustules, which soon became spreading ulcers.

Güntz insists that the prodromal pyrexia may be the only symptom of general infection present, that for a short time it may fill a gap, as it were, in the series of phenomena. The induration of the initial lesion may have disappeared, the enlargement of the lymphatic glands may be so ill-marked as to be not characteristic, while of course the first general eruption is yet to appear. Such cases must be extremely rare, and none have come under our observation; nor are they mentioned by other writers on the subject.

The second form of syphilitic fever, which is termed by Fournier *essential*, is not premonitory of an exanthem, and occurs more frequently than the prodromal form. It is seen most generally in cases where anti-syphilitic treatment has been delayed. There are three types: 1. *The intermittent;* 2. *The continuous;* 3. *The irregular.*

The *intermittent* variety is the most common, and in its perfect form closely resembles ague. The chief distinctions between syphilitic and marsh fever are:—Syphilitic fever is less complete, that is, one or other stage may be wanting or ill-marked. According to Mauriac[2] violent shivering is very rare; more frequently there are several slight rigors, but often none at all.

The following exceptional case, in which all three stages were well-marked, is given by Zambaco.[3] A woman, ætat. 26, was attacked with slight pain in the limbs and fever. A fortnight later the fever became severe. Every day at 5 P.M. she had a shivering fit lasting fifteen minutes, and followed by heat and sweat. This fit was repeated during a week, after which a papular eruption over the whole body, and other unmistakable signs of syphilis appeared. For some weeks a scruple of quinine daily, and other medicines were given without reducing the temperature. After four days of mercurial treatment the fever diminished, and in six was gone.

The rise of temperature takes place towards evening or at night. The fit is nearly always quotidian, rarely tertian.[4] The spleen is seldom enlarged. Fournier has never seen a case of splenic enlargement in syphilitic fever. Baümler,[5] however, states that he

[1] Krowczynski: Vierteljahresschrift für Derm. u. Syph. 1 Heft, 1880.
[2] Mauriac: Lyon Médical. 1880, Nos. 31, 32, 34.
[3] Zambaco: Maladies Nerveuses Syphilitiques, Case 74. See also Yvaren: Metamorphoses Syphilitiques, p. 173.
[4] Mauriac gives a case of the tertian variety, loc. cit.
[5] Baümler: v. Ziemssen's Cyclopaedia of Medicine. Eng. Trans. Vol. III., Art. 'Syphilis.'

has observed it more than once. Schuster[1] also met with a case where the spleen was swollen. Lastly, antiperiodics have no control over syphilitic fever, while mercury, and to a less degree iodide of potassium, at once check its progress.

Continued type.—This is less common than the preceding; it has two varieties (*a*) the simple continued form, (*b*) the continued with exacerbation. Neither form has a fixed duration; both may run on from four to six or eight weeks, and during this time may be the only sign of syphilis present. Thus continued fever may come on after a long series of syphilitic symptoms which have occupied several months in their evolution. Fournier gives a case where this pyrexia lasted fifty days, and the acme, 103° F., was noted on the twenty-third day.

The *irregular form.*—This is a rather common form, and of most varied character. It may commence as remittent and become continued, or even, though this is rare, it may start as continued and become remittent.

Symptoms common to the several varieties.—As in other fevers the symptoms consist of quickened but soft and feeble pulse, the range being usually between 96 and 110; but in exceptional cases it may go up to 140 or 150. The temperature oscillates between 99° F. and 103° F., but the elevation has been observed to reach in certain cases 104° and even 107° F. The face, instead of being suffused and turgid, is pale and shrunken. The appetite is not markedly lost, indeed it is often good, and sometimes morbidly increased. Thirst is not increased as a rule, but in rare cases is greatly augmented. The tongue is generally only slightly furred, and in exceptional cases even clean. Constipation is not usual; nor is diarrhœa present. The urine is not much altered in quantity or constitution. The urea and uric acid are not increased when the temperature is high, while when the temperature has considerably fallen the urea has been noted to be much increased. The phosphates and sulphates voided are slightly above the normal amount (Vajda). On the other hand, Stephanoff[2] in 800 examinations of the urine of twelve patients with early syphilis, found that during the outbreak of the rash the amount of urea was increased, and that it was notably diminished when mercury was administered.

The form of continued fever with asthenia in many respects resembles typhoid or enteric fever, and thus has received the name of *syphilitic typhose*. The febrile symptoms in this form are generally somewhat intense, the temperature ranging between 101·5° F. and

[1] Schuster: Archiv für Dermatologie und Syphilis. 1873, p. 283.
[2] Stephanoff: Inaugur. Diss., 1875; quoted in the Centralblatt für Chirurgie. 1876, p. 6.

103° F. The malaise is well marked as is also the prostration. The tongue is slightly furred, thirst and inappetence are marked, the pulse is soft and compressible. Headache is continuous, with occasionally dulness of the senses and indifference to what goes on. The duration of this state is seldom less than two weeks, is often three weeks, and may continue four or five weeks. But this syphilitic simulacrum of enteric fever, is not accompanied by gurgling in the iliac fossa, and diarrhœa is never a marked symptom.

The prodromal form of pyrexia usually subsides on the full development of the rash. The essential form which appears during the secondary period, that is in the first six or nine months after infection, is not always connected with any apparent syphilitic process, and may be present when no other symptom can be detected. The prognosis is, so far as the fever is concerned, good; it always terminates in resolution. Fournier says that it is usually met with in persons who suffer from visceral forms of the disease rather than in those where the disease expends itself on the superficial parts of the body.

The foregoing account of syphilitic fever applies only to the acquired syphilis of adults. In infants suffering from the inherited form of disease, Holm[1] of Copenhagen remarked that the temperature ranged below the normal standard during the presence of the early skin eruptions. Probably this depression was connected with the feeble condition of the children, for in some of his cases the temperature gained the healthy standard as soon as the children ceased to waste. Holm's observations comprised seventeen children between the ages of nine days and fourteen months. He also records the temperature of six children whose syphilis was acquired, and whose ages varied from one year and a quarter to two years and a half. In these the temperature was either normal or had a slight evening rise.

If mercurial treatment is employed before the appearance of the eruptions, the preliminary fever is prevented, and the rashes are postponed or assume a slower course, and are limited in extent; but mercury seldom wholly prevents the general symptoms.

Eruptions on the Skin, or Syphilides.

Syphilides resemble many of the ordinary cutaneous eruptions; hence, the various forms have been named accordingly. They are distinguished from the latter, however, by certain characters which all syphilides have in common, and by some peculiar to each form: thus their diagnosis is rarely a matter of much difficulty.

[1] Holm: Hosp.-Tidende, Q. R. VII. 2, 3. 1880.

Characters possessed in Common by the early Forms.—1. The *papular* is the commonest eruption. All the others, even the macular, are often more or less mingled with papules, and for this reason the papule becomes the type or basis of all syphilitic eruptions. With this tendency to produce papules, the different rashes do not become typical examples of the eruptions among which they are classed. The vesicles, for example, are abortive, and the scaling patches desquamate but scantily.—2. *Symmetry of the rash.* In the early stages both sides of the body, both arms, both legs, are beset with spots, because the virus producing them pervades all parts of the system.—3. *The colour of the eruptions.* At first this is often bright red, but it usually changes to the hue of raw ham, or assumes a coppery tint. As the eruption fades, this colour becomes more distinct, and ultimately turns to brownish-grey before disappearing altogether. In vascular or dependent situations, such as the face or lower limbs, a purplish tinge sometimes pervades the brown, but this is less common than the coppery-red hue. The rapid change of the bright redness to the peculiar coppery-red or raw ham-like colour, is very characteristic.—4. *Rarity of irritation.* Syphilitic rashes are almost always entirely free from heat, itching, or smarting, symptoms of which one or other is a common character of most non-syphilitic affections of the skin, and is often a prominent symptom. This peculiarity in syphilis is in part owing to the usually slow progress of the eruption, for a little transitory itching does accompany a syphilitic rash when it is very rapid in development.—5. *Favourite localities.* Most frequently the trunk, the forehead, especially along the border of the scalp, the margins of the nostrils, and the nape of the neck are chosen by the eruption. The outer aspects of the extremities more often escape, and the backs of the hands and feet are rarely marked. On the contrary, the palms and soles are frequently attacked by syphilis—situations commonly avoided by non-syphilitic rashes. Again, the favourite localities of the non-syphilitic eruptions are not those of the corresponding syphilitic rashes. For instance, simple macular eruptions prefer the extremities, while syphilitic maculæ often spare them. Non-syphilitic psoriasis, when it is scattered in patches over the surface, always prefers the outer and rough aspect of the limbs. In syphilitic scaly eruptions, the desquamating patches are often widely spread over the body, without attacking the special sites of simple psoriasis, and show a preference for the flexor aspect of the limbs. —6. *The form and arrangement* of the spots and patches in syphilis are often arches or circles, or segments of circles; a disposition less frequent in non-syphilitic skin-diseases. —7. *Multifarious character of the eruption.* A character seldom failing to the

syphilitic eruptions is their association together; the papules appear among the maculæ, the scaling patches co-exist with mucous patches, or with pustules and vesicles of the scalp. This intermingling of different eruptions is very unusual except in syphilis, where they have a common exciting cause. Among 153 patients with maculæ, Bassereau[1] found only twenty-eight free from some other eruption.—8. *Transformation of one form into another* is often observed when there is opportunity for watching the progress of the disease. It is not unfrequent to perceive smooth papules become rough by desquamation, or, if kept moist, develope into mucous tubercles.—9. A most important diagnostic sign is the *presence of syphilitic affections elsewhere*, for instance, in the lymphatic glands, the throat, &c.

The peculiarities just mentioned more or less accompany all the early syphilitic rashes; but the later eruptions, which appear when the disease is losing its activity, have not so goodly a collection of special characters. They are seldom spread widely over the body, but more often limited to a small part of its surface. The brownish tinge is well marked. They often cause considerable destruction of tissue by slow ulceration or suppuration, and therefore their sites are marked by scars. They are often the sole evidence of active syphilitic disease. Under proper treatment they commonly heal rapidly. They have an exceedingly slow course, and are apt to recur again and again.

Relative Frequency with which the various Eruptions occur.—The table of admissions into the Royal Naval Hospital at Plymouth affords some means of estimating this point. In 931 cases of general syphilis, there were—

Roseola	225
Papular and tubercular	141
Squamous	112
Pustular	159
Tertiary ulcerations	44

This table does not tell us how often each eruption occurred, but only the number of patients admitted with each particular affection. The course previous or subsequent to admission is not given, and obviously those affections which most readily attract attention will stand highest in the order of frequency.

It has already been remarked that syphilitic eruptions will change from one form to another during their progress; but eruptions of *other* diseases occurring in syphilitic persons are also now and then observed to lose their characteristics, and assume syphilitic peculiarities. Bamberger[2] relates an instance of a woman being

[1] Bassereau: Affections de la Peau Symptomatiques de la Syphilis. Paris, 1852, p. 58.
[2] Bamberger: Gazette Hebdomadaire. 1858, p. 390.

marked over the body with confluent small-pox pustules which, at the period of desiccation proper to variolous pustules, became slowly transformed into mucous patches. Other signs of syphilis were present at the time.

After this sketch of the general characters of syphilitic eruptions the description of their individual forms may be more minutely given, beginning with—

Macular Syphilide; (Syphilitic Roseola.)—Roseola, being the earliest general eruption, is the one usually preceded or accompanied by the constitutional disturbance described as syphilitic fever. Its appearance is often sudden, sometimes immediately after violent exercise, or debauchery, in which case it developes to its full extent in twenty-four hours; in other cases it does not reach its acme in less than a week or ten days. According to Hardy,[1] it is rarely absent in the early stages of syphilis. There is no doubt it is nearly always present, but we are satisfied that roseola is in rare cases completely absent, and that the papular syphilide may be the earliest exanthem.

Syphilitic roseola usually shows itself about the forty-fifth day after the appearance of the initial lesion. But it may be later, especially if the development of the disease be checked by specific treatment, in which case it may appear at any time during the first twelve-month after infection.

The eruption may be divided into two varieties, differing from each other in the size of the spots. 1. *The small maculæ* are the commoner of the two; their size is usually that of a hempseed, or a little larger; they are closely scattered over the anterior aspect of the trunk, extending sometimes to the flanks and the back; and less often to the inner sides of the arms and thighs. The forehead along the scalp may also be spotted by them (*corona Veneris*). Bassereau[2] met with maculæ in the hairy scalp twice in 153 cases. Now and then the whole surface of the body from top to toe is covered with these maculæ. The hue of the spots is at first rosy, and may simply fade without becoming brown. But the redness generally changes to dull red or purple, fading through brown to grey, and ultimately disappearing altogether. 2. *The larger patches* vary from the size of a sixpence to that of a shilling, and are slightly elevated, with borders often irregular or notched. The tint is like that of the smaller ones, but they rarely attain a full brown colour. The spots, both large and small, fade under pressure completely at first, but only partially when they have become old. At times they are so pale as to be imperceptible, unless seen obliquely, or, as it

[1] Hardy: Maladies de la Peau, p. 156.
[2] Bassereau: Loc. cit., p. 58.

were, in profile, when the slightly elevated spot can be distinguished. If the surface of the body is chilled they retain their colour, and then become distinct on the surrounding white surface.

On the scalp the rash developes sometimes as simple maculæ, but most frequently small vesicles or vesico-papules may be detected around the hairs. The serous secretion being abundant, the vesicle is soon covered by a small crust or scab, and as such commonly attracts the patient's attention. Fournier remarks that roseola of the scalp may cause fall of the hair at the spots, thus producing small areas of alopecia.

The duration of the spots varies greatly, from three to four days to as many weeks, when uninfluenced by treatment. When they disappear, a brownish stain is left, which sometimes desquamates. Roseola, like all syphilitic eruptions, is liable to relapse, but when doing so does not bring with it a repetition of the fever. Such relapses seldom exceed a few patches on the chest and abdomen, or along the forehead, which often arrange themselves in circular groups.[1]

Like other syphilitic rashes, roseola is usually free from itching, smarting, or irritation of any kind. Being an early manifestation, its usual accompaniments are enlarged inguinal lymphatic glands; sometimes the cervical glands enlarge also. At this time the fauces, too, are commonly marked by exanthematous reddening, or even excoriations. The hair sometimes falls while the roseola still remains, but usually not so soon as this. Small and scaling papules are very commonly developed about the nape of the neck, the bend of the elbows, or hairy scalp, before the roseola has departed.

The anatomical structure of the roseolous spots has been examined by Biesiadecki [2] and Kaposi.[3] These observers describe the walls of the capillaries in one of these spots to be beset with leucocytes which project inwards and outwards through the wall of the vessel, and also lie in a sharply limited area immediately around it. In the tunica adventitia of the larger vessels of the corium in the area of the spot, are found both round and spindle-shaped cells. This condition is best seen in the small artery that is directed towards a papilla; the lumen of the vessel is somewhat narrowed, but the capillary on the contrary is widened. Kaposi also finds caudate cells in the connective tissue of the papilla, and other cells which, according to Heitzmann, who drew Kaposi's illustrations, denote commencing proliferation of the connective tissue cells.

[1] Kaposi: Syphilis der Haut., &c. 1874, Tafel xxi.
[2] Biesiadecki: Beiträge z. phys. u. patholog. Anat. der Haut. Sitzungsbericht der K. K. Akad. der Wissen. Juni, 1867.
[3] Kaposi: Loc. cit. IIter Lieferung. p. 89.

Diagnosis.—The syphilitic origin of the maculæ is denoted by the spots being most abundantly scattered over the chest and belly, the face being often wholly free; by the absence of heat and itching; by the presence of enlarged glands, and often, of the induration at the point of contagion.

Syphilitic roseola may closely resemble the eruption of *measles*; but the latter begins on the forehead, and is attended with catarrh, bronchial irritation and suffusion of the eyes. *Scarlatina* is distinguished by the form of the rash, the colour of the skin being produced not by defined spots of greater or lesser size, but by a general bright redness of the skin closely beset with puncta of a deeper tint. The high temperature and the peculiar condition of the tongue and throat of scarlatina are also wanting in syphilitic roseola. *Simple roseola* is distinguished by the localised form of the rash and the absence of signs of syphilis elsewhere. The itching and smarting, the large size of the patches, their elevation, and their deep red tint, distinguish *Roseola balsamica*, occasioned sometimes by using copaiba, from the syphilitic roseola. Roseola balsamica also appears first on the backs of the hands and feet, and often spreads rapidly into large confluent raised patches, both there and about the joints. The brownish stains remaining after the departure of syphilitic roseola may be confounded with *Pityriasis versicolor*, if it be not recollected that syphilitic stains are beneath the cuticle, while pityriasis is on its surface. But if the scales of pityriasis be scraped off and put under the microscope, the *microsporon furfur* may be recognised. Pityriasis again prefers the middle line of the body both back and front; and it is only in cases where it spreads outwards from these situations that it is likely to be mistaken for a syphilide.

In persons with dark skins, Hindoos and Negroes, the areas occupied by the roseolous spots are generally much darker than the rest of the skin for a time. Occasionally, however, the sites of the spots become paler than the natural hue of the skin, so that a black man's skin assumes a delicately greyish mottling. This character is only a temporary one. R. W. Taylor[1] points out as a distinction between these pallid spots and leukoderma, that in the latter the margins of the white patches are defined by an intensification of the natural pigmentary colour of the skin.

When the skin is free from all other rash towards the close of the period of general eruption, there may be sometimes detected on the forearms and legs large faintly marked rings which fade under pressure or are only distinctly seen after a bath. They never scale,

[1] R. W. Taylor : Archives of Dermatology. 1877, p. 118.

and are exceedingly chronic in their course; their only significance being their syphilitic origin.

The Prognosis of roseola is, so far as the eruption is concerned, good; the rash causes no inconvenience, but it betokens that the poison is active, and that other eruptions must be expected.

Papular Syphilides comprise Miliary, Lenticular, Scaling, and Leproid syphilides, the so-called Psoriasis palmaris and plantaris, and Mucous patches. The foundation common to all these varieties is the papule, that is, a small elevation of the skin, solid, resisting, abruptly defined, varying in size, lasting an uncertain length of time but disappearing usually by resorption and rarely by ulceration. The colour is the same in all, bright rosy at first, then brownish red or purplish red, growing pale again as the papule subsides. As the papule reaches full development, the cuticle separates, usually in dry scales, as in scaly syphilides; sometimes a vesicle forms in the summit of the papule, as in miliary syphilides. Where the papule is exposed to much moisture, for instance, on the labia majora, desquamation is replaced by the secretion of a viscid fluid, and the papule assumes the aspect of a mucous membrane; hence it is called a mucous patch or tubercle. The early varieties appear while syphilis is in full activity, hence they are accompanied by some other evidence of the presence of the virus; such as muddy complexion, sore throat, fall of the hair and enlarged lymphatic glands. Their outbreak is occasionally heralded by febrile reaction. At an early period of the disease the papules are scattered pretty widely over the trunk, head, and limbs; they develope usually within the first four months after contagion, indeed they frequently appear before the roseola has faded away. In later stages of syphilis the eruption is commonly limited to a few isolated groups of papules on the limbs or face; but these may be repeated over and over again during a period of several years.

The Anatomy of the small (miliary) papule is briefly as follows:[1]— On the prominent surface of the papule the epidermis is sometimes increased in thickness; sometimes, on the contrary, partial desquamation has occurred, in which case the most superficial layers of epidermic cells have disappeared from the middle portion of the papule while the epidermis remains normal at the periphery. The result of this is production of the peculiar silvery 'collarette' or border round the base of the papule which is so characteristic of its syphilitic nature. The Malpighian layer is a little thickened, and beneath it the papillary vessels are gorged with blood, as are also the capillaries which surround the sweat glands and their ducts. The connective tissue of the papilla is normal; but lymphatic cells

[1] See Cornil, loc. cit. p. 171, *et seq.*

in considerable numbers are present in the tissue around the capillaries. In the deeper connective tissue beneath the papule, the blood-vessels are surrounded by a zone of leucocytes which have escaped from them. These cells accumulate along the course of the vessels, and cause displacement of the bundles of fibres of the neighbouring connective tissue.

In the larger (lenticular) papules there is not only inflammation of the papillæ and superficial portion of the corium, but the whole thickness of the derma as well as the subcutaneous cellular tissue is also inflamed. In the derma the fibres of connective tissue are separated by round cells. More deeply, the adipose cells of the subcutaneous cellular tissue are inflamed, each fat-cell being surrounded by a circular row of lymphatic cells. Subsequently the fat lobules become entirely transformed into islets of connective tissue devoid of fat.

After this general notice of the papular eruptions the different varieties may be more minutely described.

Miliary Papules (*syphilitic lichen,*) commence with the rapid appearance of minute projections, thickly scattered over the forehead, neck, and shoulders. Bright red at first, they soon turn brownish red; the colour fades under pressure when the papules first come out, but soon becomes permanent. If closely examined when it first appears, a minute vesicle can often be detected on the summit of the papule, but papule and vesicle are together not larger than a pin's head. After a few days the vesicle shrivels to a silvery scale that soon drops, or breaks at the centre to form a white 'collarette' round the red shining papule: subsequently the papule subsides to a bluish red stain or even depression. The whole crop does not appear at once; fresh spots develope among those already desquamating. The size of the papules also varies, some being not larger than a small pin's head, whilst others increase until they attain the size of a millet seed. Another peculiarity is often observed in the arrangement of these miliary papules, and is best seen on the back, where the little spots form collections of twenty or forty in a group, the skin between the groups being free. Sometimes the development is sufficiently acute to render the vesicles small pustules, which however soon dry up and leave thin scabs.

The *seat* of this eruption is usually the forehead, neck, shoulders, and breast; it rarely spreads over the whole of the trunk or upper limbs. The eruption attains its full development in a week, and commonly begins to fade in twenty or twenty-five days; but unless carefully treated, and sometimes even then, this rash continues for three or four months by fresh crops of papules. Ultimately the stains of the rash disappear completely.

Miliary papules are always accompanied by some other syphilitic affection, such as larger papules, mucous patches, enlarged lymphatic glands, sore throat, or fall of the hair. These characters distinguish this syphilide from ordinary lichen, which moreover is accompanied by much itching, from which the syphilide is usually free. Itching, however, is more often present with lichen than with any other of the early eruptions. Compared with other syphilides, the lichenoid is not a common form; Zeissl ascribes ten per cent. of papular syphilides to the miliary form. In our own notes of ninety-nine cases of papular eruptions, three were of the miliary form; two of the patients being women. Repetitions of the miliary eruption after its first departure are exceedingly rare, though they are said to occur; relapse of the disease after this eruption most commonly assumes the larger papular and sometimes the pustular form.

The Larger Papular Eruption (*Lenticular, or Nummular Syphilide*), sometimes termed syphilitic psoriasis, is the commonest syphilide during the first year after contagion. In this variety the papules vary in size from a lentil to a sixpence; in rare cases, forming patches as large as half-a-crown. Like the smaller form, they begin in rosy red spots, and extend laterally. In a few days the colour loses its brightness, and the cuticle scales off. If the papule is small, and the desquamation confined to a silvery border of loosened cuticle, it is termed *Lenticular syphilide*. When the papule has grown into a large patch, and the cuticle is peeling from all its surface, it is often wrongly called *psoriasis*.

The large nummular or coin-like papules form distinctly elevated plateaus above the skin, most commonly of truly circular shape, and thus form objects very characteristic of syphilis.

The larger the papules, the fewer they are in number, and also generally the more closely do they present the so-called 'coppery' hue; which is, however, far more like the colour of raw ham. When the papules are confluent so as to spread in a continuous sheet over a large surface, the perinæum, scrotum, or vulva for example, the eruption forms an uneven dull red or damask-tinted surface, which is termed *napiform* by French writers.

Seat.—No part of the body altogether escapes this eruption; when it appears across the forehead from temple to temple close to the scalp, and even continued to the occiput, the eruption is called 'corona Veneris.' The nape of the neck, the shoulders, the trunk, the inner aspects of the limbs especially the flexures of the elbows, wrists, and knees, are the localities most commonly occupied by scattered groups of papules of varying size and development, some remaining simple papules, others reaching the form termed psoriasis.

During the first year after contagion the eruption pervades the body

widely, and is seldom grouped in definite figures. But later in the course of the disease, especially when a relapse of a previous eruption, the papules often arrange themselves in circular or figure-of-eight form, or in large round patches that extend centrifugally. These constitute *Lepra syphilitica*. The number of these groups present at one time, is not great; two or three on the arms or the shoulders, face, or legs, commonly form the whole extent of the eruption. When a relapse of a former eruption, the development of the papular rings may be so scanty that they hardly rise above the surface of the skin. These rings in their most developed form are coppery red, shining on the surface, and do not disappear under pressure; they are seldom larger than a sixpence or a shilling. The chin and cheeks about the mouth, when shaved, and the neck are favourite localities for this variety. *Lepra* is usually a late form of eruption, but not always so: it may appear even within three months after contagion as configurate groups of papules, while the discrete variety is scattered plentifully over the body.

There is a variety of the papular eruption that is also configurate, which sometimes developes unusually early, namely, in cases of initial sores of the glans, where the earliest rash may form circular or discoid papules of the prepuce, and sheath of the penis. The groups are not always circular, sometimes the papules are arranged in sinuous or crescentic rows. This rash may appear before any general eruption breaks out on the body, and we have seen it well marked six weeks after contagion. It is probably similar in kind to the groups of small papules which are described as being scattered on the skin near the point of contagion in some cases of experimental inoculation.

The larger papular syphilides often continue four or five months, fresh groups of papules succeeding the earlier ones. They return more frequently than the miliary form, either by a repetition of isolated papules in different parts of the body, or by the development of one or two leprous patches on the shoulders, arms, or elsewhere. This uncertain duration makes it impossible to assign a set limit to the papular eruption. The *lenticular* and *scaling* rashes do not usually recur later than eighteen months after contagion; but they may, as exceptions, much exceed this period, and reappear several years later. *Lepra* is common in the second year and not very rare for five or six years after infection.

Diagnosis.—The only other eruption at all resembling the papular and scaling syphilides is psoriasis vulgaris; nevertheless, the distinctions between the scaly eruptions of syphilis and simple psoriasis are numerous. In the syphilitic affections, the papules bearing scales are raised firm patches, the scales are easily removed and scanty, being

attached as a frill round the border of the papule, and by a thin film on the summit. The surface of the papule when cleared of scales is not raw. The desquamating patches do not cover a large area; having reached a moderate size, they remain stationary or dwindle slowly away. Itching is rare, though sometimes present with the smaller papules. When syphilitic papules form on the scalp the scales are mixed with scabs, which make the papules resemble isolated pustules. Syphilitic desquamating papules also affect the inner aspects of the limbs, and especially the delicate skin at the flexures of the joints, while the outer aspects of joints, especially the knee and elbow—the favourite seats of psoriasis vulgaris—commonly remain free from them. Moreover, if the papular eruption is so closely spread over the body as to resemble psoriasis vulgaris, it occurs at a period when other syphilitic affections are present to remove obscurity from the diagnosis. In simple psoriasis the patches scattered over the body vary in size from a lentil to a half-crown, having more often the larger than the smaller dimension. Itching is moreover a prevailing character in psoriasis vulgaris, and the patches are never much, usually not at all, raised above the level of the skin. The scales are plentiful, adherent, and sometimes so thickly imbricated as to give the patches a white nacreous aspect; when the surface is cleared of them it is pinkish red, not coppery, and easily bleeds. The palms and soles nearly always escape in simple psoriasis, unless the whole of the body is covered by the eruption. Notwithstanding the very wide extent of the eruption, the patient's general condition in simple psoriasis is often excellent.

The prognosis of the papular syphilides is good; the papules rarely ulcerate, and usually disappear in a few months.

Papulo-squamous affections of the Palms and Soles.—The papular eruption is so much altered in appearance by the peculiarities of the skin in these localities, that it has been distinguished as a separate eruption by many observers under the incorrect title of *Psoriasis palmaris*, and *plantaris*. When examined carefully, however, it is found to possess characters identical with those common to all papular syphilides. The papules commence as dull red spots, at first disappearing under pressure, but soon losing that character. They are distinctly circumscribed, and of a size between that of a hempseed and a threepenny piece. The elevation above the surface is often inappreciable, but the red spots are easily seen through the thick cuticle of the palm and sole. The tint of the patches soon fades to a brownish hue, and often becomes quite obscured as the cuticle thickens over them. The epidermis, being very dense and hard, remains for some time more or less adherent and continuous with that around the papule; eventually it is lifted or loosened in

one layer, which cracks into bits and peels slowly off, sometimes in large pieces, instead of in fine scales as elsewhere. The cracks in the loosened cuticle frequently follow the natural folds of the skin and make painful chaps. While the thickened cuticle, though lifted from the middle of the papule, remains attached by its margins, the surface acquires a peculiar blistered appearance. This syphilide of the palms and soles is usually symmetrical in the early years after infection; but when a relapse of old standing disease one palm or sole is often alone attacked. In rare cases the epidermis of the sole becomes thickened into brittle horny layers which crack and peel off irregularly, leaving most painful fissures sometimes one-fourth of an inch deep. This variety is of very slow development, often confined to one hand or foot, and most difficult to eradicate. In one patient under our care it has continued more or less severely for ten years.

This affection may be the only sign of activity of the poison, but usually other syphilitic lesions are also present. In nine cases of palmar psoriasis, we found mucous patches of the tonsil in five, iritis in two, and ulcers on the side of the tongue in three. Seven had a few papules on the nucha or shoulder. This eruption is perhaps most frequent in the second year of syphilis, but often occurs much later. In a small number of cases it accompanies other papular syphilides a few months after contagion, and we have seen it appear alone as the first eruption.

The diagnosis is simple. If the scales are large, the affection may be mistaken for chronic eczema, but eczema always extends beyond the palm to the backs of the hands and arms, and usually does not form isolated patches distinctly defined from the healthy skin. Ordinary psoriasis is not met with on the palms and soles, except when extending thither from well-marked patches on the wrists or backs of the hands and feet. Hutchinson[1] and Tilbury Fox[2] nevertheless state that a non-syphilitic scaling eruption is met with on the palms even when not present elsewhere on the body. According to Fox, when not syphilitic, the eruption begins at the margins of the palm or sole, not near the centre, and the papular character of the eruption is little marked. We have never seen an instance where syphilis was not the cause of limited papulo-scaly disease of the palm or sole.

The prognosis of this syphilide is not good; a relapse of it is a sign of great obstinacy in the disease; its duration, even when careful treatment is pursued, is often long, and recurrence is frequent.

Moist papules.—(Mucous patches, mucous tubercles, condylo-

[1] Hutchinson: Clinical Lectures at the Hospital for Diseases of Skin in 1876.
[2] Tilbury Fox: Atlas of Skin Diseases. 1877.

mata, "*plaques muqueuses.*") These constitute one of the most frequent forms of syphilide. The patch begins as a flat elevation, inclining to circular, from a fifth to half an inch in diameter. The colour is at first red, sometimes rosy red, but soon passes to that of raw ham, and when the papule declines, to a brown hue. If several papules lie near together they often coalesce into one patch. Sometimes, on the contrary, if the papule originate in a hair follicle, it remains solitary and becomes an indolent pustule. The thin pellicle over the papule is soon replaced by a viscid purulent secretion, which readily decomposes, smells offensively, and produces similar patches or even ulcers where it trickles. If the surfaces, on the contrary, are kept clean with proper astringent remedies, the secretion ceases, and the papule sinks down, leaving a stain which gradually fades away altogether.

Mucous patches are met with both on mucous membranes and on the skin, especially at the junction of the latter with the former; also on any part of the skin kept moist by exudations or secretions. The most common sites are the female external genitals, the anus, the perinæum, the scrotum, the angle of the mouth or nostrils, the fauces, and inner side of the cheeks, especially if a ragged tooth chafe the part. They form also, but less commonly, between the toes, in the axilla, in the folds of the groin and breast, at the navel, behind the ear, or under the chin—situations that, in many stout persons, are kept constantly moist by perspiration. When seated round the anus, they often spread along the perinæum in groups of half a dozen patches at once. Here, too, they may assume a rough granular wart-like appearance, and be broken up by cracks and fissures (rhagades). Constant chafing of the skin opposite a patch, converts the irritated part into another surface of similar size and form. Mucous patches occasion much soreness, whence they attract the patient's attention sooner than any dry syphilitic eruption. In both sexes the initial lesion may, when kept moist, change to a moist papule by spreading a broader surface and secreting a thin fluid. The secretion of mucous patches is very contagious: owing to the abundance of the discharge and the early period of the disease at which it is generally produced, this affection is that which most frequently propagates syphilis. In women the mucous tubercle is frequently the first symptom observed, and sometimes the only one detected in the whole course of the disease.

Diagnosis.—There is very rarely any difficulty in this; the patches are characteristic in themselves, and are usually accompanied by other syphilitic affections. Sometimes over-grown warts with excoriated flattened surfaces resemble mucous tubercles; but these warts have a more or less pedunculated attachment to the skin and are

rugged and irregular, whereas the mucous tubercle is as broad at the base as at the summit.

Prognosis.—The moist papule is evidence of syphilis in full career and is a form very apt to return. Though most common in the first six months after infection, they may return, as rare exceptions, many years subsequent to it. Horand[1] has noticed them twenty years and Diday[1] even thirty-four years afterwards.

Vesicular and Pustular Syphilides have been distinguished by the names of herpetiform, eczematous, varioliform, impetiginous, acneiform, ecthymatous, rupial, and pemphigoid syphilides. This long string of epithets has been applied to the various forms according to their resemblance to the similarly named simple eruptions. Though no essential difference exists between syphilitic vesicles and pustules, division into two groups is useful. The vesicular forms are much more rare and belong chiefly to the earlier outbreaks ; while the pustular are often, though by no means invariably, developed among the later consequences of the disease. They also are more frequent in debilitated than in robust persons.

Common characters of the vesicular forms.—A vesicle, varying in size from a pin's head to a pea, forms on the summit of an elevated areola (a papule), and fills with clear fluid. In this condition it remains one or two days, and then shrinks, leaving the areola covered by a small scale, which itself soon falls and leaves a coppery-red papule. Sometimes, though less often, the fluid of the vesicle quickly assumes a puriform condition, and thus forms a pustule. These eruptions are scattered over the body without much predilection for locality, though certain forms are more commonly seen in particular parts than in others. The primary papules are well developed in some cases, less in others; in the rupial variety the papule may be very scantily formed. The colour of this papule is red at first, soon changing to a coppery tinge, as in all syphilitic eruptions. The papules, moreover, are in some instances surrounded by a reddish halo. The vesicular eruption is sometimes rapid in appearance, in which case a considerable number of vesicles break out together, and are accompanied by fever. This is rare: usually the eruption is scanty, and prolonged by fresh crops of vesicles and papules, until the syphilide has run its course. A papule lasts about three weeks from its beginning to its subsidence, but the eruption continues, by successions of papules, from three weeks to three or four months. The vesicular eruptions mostly appear during the first six months of the disease. Still, they are sometimes delayed or repeated a year or more after infection.

[1] Horand : Diday : Lyon Médicale. Dec. 7, 1879.

The *diagnosis* is seldom difficult, notwithstanding the similarity often seen between simple and syphilitic vesicular eruptions; but it is rendered distinct by the invariable presence of other evidence of syphilis, namely, the enlarged glands, the papular base of the vesicles, the slow progress of their development, and the absence of any predilection for the parts of the body selected by the corresponding simple eruptions.

Prognosis.—If the patient is well cared for, the eruption seldom works any very serious effect. If neglected, or if the patient is very greatly debilitated, the skin may ulcerate beneath the scabs, and troublesome sores are then formed.

Eczematous syphilide is a very rare affection. It consists of little vesicles, sometimes scattered irregularly over a limited area, sometimes very distinctly collected into groups. This area is rosy-red and extends somewhat round the vesicles, which are slightly raised from the skin, as if they were summits of commencing papules. They remain small and are flat on the top, and do not burst; nor does the cuticle crack, as in true eczema. After four or five weeks, during which period they make comparatively little progress, the general redness of the surface fades, and the fluid dries out of the vesicles, the papules on which they were seated become separate, and assume the ordinary coppery hue.

In a patient, a woman of 35, under my care at the Lock Hospital, this eruption began on the flexures of the wrists, ankles, and soles. Very minute closely-set flattened vesicles formed on a bright-red area, that itched and tingled much at night. The vesicles did not break, and no fluid escaped; but after four weeks the eruption spread in scattered groups of papular vesicles beyond the red areas, and in six weeks the arms and legs were spotted with unmistakable syphilitic lenticular papules, and the red areas were altogether gone. I purposely withheld specific treatment in this instance until the general papular eruption appeared, in order to observe the course of this rare form.—B. H.

Very rarely the development is acute; the vesicles then fill with pus, burst, and thick scabs form, under which the papules ulcerate slightly. This form, which resembles ordinary eczema more closely than the other, is notwithstanding far less rapid and less irritating than genuine eczema.

Herpetiform syphilide.—This is so called from its resemblance to common herpes—both H. phlyctenoides and H. circinnatus.[1] Vesicles, as large as a pea, form in a group pretty closely together, their contents being yellow from the first. They quickly break, and the fluid dries and forms a thick yellow crust which forms again if removed. Beneath the crust the skin ulcerates slightly, and is raised

[1] Hardy, loc. cit., p. 162.

either into a broad copper-coloured papule if the vesicles had amalgamated, or into a group of several papules if the vesicles had remained separate before breaking. The course is very chronic, and there is no smarting nor itching.

One a woman of 27, who had this rare eruption, the crusts had existed for six weeks, in spite of local applications; but the eruption readily healed when the patient was brought under the influence of mercury.

The rash is usually confined to one or at most two such patches on the face. In two cases the group was situated on the upper lip, and was accompanied by mucous patches of the vulva and anus. In both, the main distinction from common herpes was the hard leathery papule in which the vesicles were seated. In the other form, according to Hardy, the vesicles arrange themselves in rings and serpentine lines. They are distinguished, like the first, by the thick crusts which occupy the rings. They differ from herpes circinnatus parasiticus in leaving the skin inside their rings unaffected. Both forms have a very slow course, but subside readily under mercurial treatment. Hutchinson[1] has described a variety of herpes appearing in syphilitic persons which is easily mistaken, by the aspect and arrangement of the vesicles, for herpes zoster. An unvarying character of this syphilitic eruption is its bilateral symmetry, a distinction almost never possessed by herpes zoster.

The *varioliform* and *varicelliform* syphilides have occasional importance from their liability to be confounded with small-pox or chicken-pox. When the former is simulated, the pustules are usually discrete, flattened, and sometimes even umbilicated like those of true variola; but the accompanying constitutional disturbance is slight. Pain in the back and vomiting are absent; and further, the eruption does not affect specially the backs of the hands and face, being most perfectly developed on the trunk, and only gradually extending to the limbs. The course and duration of the syphilide are also longer, while other signs of syphilis are almost invariably present.

The varicelliform variety is more papular than true varicella; the vesicles are more closely grouped, while the crusting and ulceration that follow are much greater. As with the varioliform syphilide this imitator of chicken-pox is more slowly developed than varicella itself.

Pustular syphilides.—The common characters of these are the same as those of the vesicular form. The *acneiform* eruption is an exaggeration of the vesicular form, and occurs at an early period of the disease. It consists of an elevated non-suppurating base and

[1] Hutchinson: London Hospital Reports, 3rd series.

areola, bright red in colour at first, but becoming more characteristic afterwards. A pustule is developed on this base, and dries into a yellowish crust which falls and leaves an elevated spot that is sometimes ulcerated. Though selecting chiefly the face and shoulders, the pustules are found all over the body, except on the palms and soles. They are very slow in their course, and last several weeks. This syphilide, unlike true acne, is an eruption of a few weeks' duration, the black puncta are not mingled with it, and there are always present other signs of syphilis, such as the hard initial lesion or its hardened scar, multiple enlargement of the lymphatic glands, mucous patches or erosions of the fauces, &c. In common acne some of the pustules are developing at the same time that others are fully developed, while others again have cicatrised; in the acneiform syphilide all the pustules develope within a short period of each other.

Impetiginous syphilide.—A pustular syphilide is termed impetiginous when the pustules are small, grouped together, and more or less well-furnished with an areola. The bases are less solid, and penetrate less deeply into the dermis than in the ecthymatous form. The crusts also are not nearly so thick and large.

Ecthyma is almost wholly confined to cachectic subjects. Large isolated pustules form with solid bases. Each pustule originates commonly in a hair follicle, and developes slowly till it is as large as a pea. It then bursts, and dries into a scab which falls, carrying the hair with it, and leaving an ulcerated surface. These pustules differ from simple ecthyma in being much slower in development, and in having a coppery areola. The individual pustules last two or three weeks, and the eruption is usually continued, by the outbreak of fresh pustules, for as many months. Ecthyma is met with all over the body, but more especially on the lower limbs.

Rupia.—This form of syphilide does not appear until long after infection, if the disease observe the usual course; but it may appear within six and even within three months after infection, when the progress is very rapid. Most commonly before rupia appears two or three years have passed since infection, and the patient has undergone, at different intervals, various eruptions or affections of other parts of the body. When rupia is seen in children, the disease has been acquired, not inherited. Zeissl[1] says it never appears in inherited syphilis: on the contrary, that when met with in children the scar of the initial lesion can always be found.

Like other pustular eruptions, rupia breaks out when the patient's

[1] Zeissl, loc. cit., p. 162. See also Sparks: Lancet, vol. i. 1874, p. 869; and Dowse: Clin. Trans., vol. x., 1877, p. 169.

system has little restorative power. It consists of large pustules or bullæ, varying in size from a pea to a cherry. The fluid, almost clear at first, quickly becomes puriform. Then an areola appears round the bulla, but the elevated base, so characteristic of the other forms, is sometimes absent in this syphilide. The pustule by the second or third day becomes flaccid; its contents ooze out, and dry into a crust, under which the skin ulcerates. Fresh secretion dries as it forms, until a large scab of a yellowish green or brownish green colour results. When this crust falls it leaves an indolent and spreading ulcer with sharply-cut, irregular borders that, if left to itself, for a long time enlarges instead of healing. In some cases, the crusts remain long adherent, growing thicker by increasing their base, and by the discharge drying beneath, until they assume the form of a limpet-shell or cone. These crusts are often rough and furrowed on their surface, and may conceal the ulcer completely, or the ulcer may extend beyond their margin. The scars are indelible, white and reticulate in appearance. Crops of bullæ may succeed each other for a period of two or three months. Sometimes they are arranged in rings or groups, sometimes mixed with leprous papules, sometimes scattered irregularly over the body, and generally with greater profusion on the limbs than on the trunk. When the eruption is grouped, the coppery or purplish areola is well marked, and the ulcer frequently creeps along in a serpiginous manner, leaving, as it heals, white scars in its course. This affection, though late in its appearance, is, according to Zeissl, generally preceded by febrile action. We have marked this rise of temperature on a few occasions also. More common accompaniments are periosteal affections, and great bodily debility.

The *diagnosis* is usually easy. Syphilitic rupia is far more frequently met with than *rupia vulgaris*, from which it is distinguished by the areola, by the presence or history of other syphilitic affections, and by the slow course of the eruption. The diagnosis, now and then, is difficult, when the eruption breaks out many years after the disease has apparently subsided. In these cases the areola is often purple, the suppuration is copious, and other symptoms of syphilis may be absent. In such cases, it is hard to decide sometimes between the syphilitic form and the rupia that is said to originate in scrofula. The scars of syphilis are round, slightly sunken or foveated, whitish, very pliable and non-adherent to the parts beneath. The scars of scrofulous sores are irregular, thickened, folded or seamed, and often toughly fastened to the tissue beneath.

The *prognosis* is grave, for the eruption is slow, leaves indelible cicatrices, and denotes that the constitution is severely affected by the disease.

Pemphigus.—This eruption, when a symptom of syphilis, is hardly ever seen in adults. But Bassereau,[1] Zeissl,[2] Hardy,[3] and Tilbury Fox,[4] record instances where its connection with acquired syphilis was clearly established.

In the first of Bassereau's cases, a girl of 20 (figured in the 25th plate of Ricord's "Iconographie"), the eruption attacked the soles, and was accompanied by other unmistakable signs of syphilis. In his second case, the patient was a young man of 21. The pemphigus appeared only on the palms, and was accompanied by mucous patches round the anus. Both symptoms belonged to a relapse that followed six months after mucous patches of the throat, roseola, crusts in the hairy scalp, and enlarged cervical glands had disappeared. The bullæ in this case projected little above the surface, and, but for the serum effused between the cuticle and the cutis, resembled palmar psoriasis. Zeissl's case is particularly satisfactory. The patient, a young man, suffered for some months from the bullous eruption and other forms of syphilis, which yielded readily to mercury when other treatment had failed. The bullæ in this case developed on the palms, backs of the fingers, and hollows in front of the elbows.

Tubercular Syphilides are solid rounded elevations of the skin and subcutaneous cellular tissue. They are late affections, appearing usually in those who have the syphilitic dyscrasia well marked, when three or four years have elapsed since infection. The tubercles are of two kinds, superficial and deep. The *superficial*, are prominent on the surface, of coppery-brown, or purple-brown colour. Usually they are grouped together; when this is the case, the skin between the tubercles has sometimes the same colour also. The projections vary in size between a pea and a bean. They occasion no pain or irritation in their uncomplicated condition. They are met with on all parts of the body, but most often on the face, especially the forehead. On the nose the tubercular syphilide sometimes assumes a special aspect. Small tubercles or wart-like growths develope along the furrow where the ala joins the cheek, which scale but little. The separate tubercles usually coalesce and then break down by ulceration; the sore thus produced forms a chink along the furrow, which is covered by a yellow scale or scab. The skin around the tubercles, before they begin to break down, is unchanged; but when ulceration has advanced, general infiltration spreads over the ala which gives to a great part of it a coppery hue.

This eruption is seldom widely spread, but confined to one or two groups of tubercles, for their appearance is usually delayed till the general infection of the blood is beginning to subside. Its course is slow, and marked by the absorption of the first tubercles, and the

[1] Bassereau: Loc. cit., p. 401.
[2] Zeissl: Loc. cit., p. 154.
[3] Hardy: Lancet, Jan. 8th, 1870.
[4] Tilbury Fox: Lancet, vol. ii. 1874, p. 43.

production of new ones, while the eruption migrates over the surface for a long time before disappearing. Ulceration sometimes takes the place of absorption, the tubercles are then covered with thick scabs, and become very tender and painful. The scars of the ulcers are permanent, white and depressed. The tubercular syphilitic eruption is very apt to recur again and again.

The *diagnosis* of this variety is easy; the seat, the coppery aspect, the slow course, and the presence or history of other syphilitic affections readily distinguish its nature.

Serpiginous Tubercular Syphilide, or Syphilitic Lupus.—A variety of the tubercular eruption, always attended with serpiginous ulceration, has received the above name. Its course is as follows: on any part of the body, but most often around the angle of the nose, on the chin, or forehead, a tubercle appears, rising above the surface and spreading at its margins, where successive little tubercles, merging into each other, are developed. As the group attains an area the size of a shilling or half-crown, degeneration begins in the older tubercles which quickly ulcerate, and their secretion covers the ulcerating surface with a thick scab of yellowish or brownish colour. If the scab be removed a creeping ulcer is found, healing perhaps at one portion, but spreading outwards with a sharply cut margin; the ulcer is not deep and does not secrete a very great quantity of discharge, but it continues to spread so long as tubercles are formed along its margin. In this way the disease may last for years, travelling over a great part of the body before it is arrested. The scar left by the ulcer is permanent, of a shining white colour, and somewhat depressed below the surface of the healthy skin.

Diagnosis.—The main characteristic is the tubercular elevation of the skin which precedes the ulcers; added to this are the colour, chronic course, and history of other syphilitic affections. Common lupus is usually distinguished by its history, and by its indifference to anti-syphilitic remedies, but where the history fails to give certain indications, the diagnosis may be impossible, until the time necessary for observation has elapsed. Hutchinson draws attention to the peculiar semi-transparent infiltrations of the skin contiguous to the ulcerating part as a valuable aid in distinguishing non-syphilitic from syphilitic lupus.

Deep Tubercles, or subcutaneous gummata—These are seldom seen until some years after infection, though they may occur in the first few months of syphilis. A number of such early cases have been reported by Mauriac.[1] Solid swellings form in the subcutaneous

[1] Mauriac: Annales de Derm. et de Syph. 1880, Oct., p. 645, and 1881, Jan. p. 45.

cellular tissue the size of a pea, over which the skin is at first movable and of its ordinary colour. They give no pain, and are often undetected until they have enlarged to the size of a nut, when they raise the skin over them into little prominences. Having developed thus far, the skin changes colour and the tumour softens: in this stage they resemble abscesses. The skin eventually breaks, a viscid fluid escapes, and a deep ulcerating cavity remains. If absorption take place before ulceration is reached, they gradually dwindle away, and may leave no trace of their presence; but if the surface is broken, the scar will be indelible. They are commonly developed on the limbs, perhaps most frequently near the knees and elbows, but they may occur on any part of the body.

These deeper tubercles are identical with the so-called gummy swellings of the internal organs. They begin to form at the deepest part of the dermis among the masses of adipose tissue, and consist of nucleated cells, nuclei, and granules packed together in a network of cellular tissue. The permeating blood-vessels are often blocked with fibrin, their walls swelled and thickened by proliferation of the cells of the endothelium and adventitia. The swellings are usually separated from the surrounding parts by a close covering of blood-vessels and cellular tissue, which forms a limiting membrane.

This eruption is common. When present, though often the sole symptom of the disease, it may be accompanied by other affections, such as enlarged testis or nodes.

Diagnosis.—The following characters aid in distinguishing the syphilitic growths from *cancer*. The syphilitic tubercles are more often multiple than single. The form of the tumour is regularly ovoid, rarely indented, and pain is more often absent than present. In cancer, on the contrary, the tumour is single, of indented or irregular form, ill circumscribed, and painful, the pain being of a lancinating character. The disintegration of gumma begins with central softening, which gradually extends to the surface, and as soon as the matter has escaped, leaves at once a considerable cavity. The cancerous ulcer is irregular, fungoid, fœtid, bleeds readily, and has a wide surface. The most distinguishing point in cancer is the rapid implication of the neighbouring lymphatic glands, which, in syphilitic disease, remain long unaffected.

The so-called **Pigmentary Syphilide** appears during the first or second year after infection; according to Hardy,[1] it usually comes between the earlier and later eruptions, when the disease has lasted about six months. It is not a well-marked affection, and consists of pale brownish-grey stains, the size of a sixpence, grouped together

[1] Hardy: Maladies de la Peau, p. 154. 1858.

over a more or less extended surface, the neighbouring skin being whiter than elsewhere. The spots not infrequently run together, and thus form more or less irregular patches. The affection is very chronic in its course, and little influenced by mercury or the iodides. There is not the slightest elevation or desquamation of these spots, which moreover are quite free from itching; their commonest seat is the neck and the bosom in women, but they have been met with on the flanks and thighs. They are hardly ever seen in the male sex. The connection of this affection with syphilis is still debated by authorities on skin diseases. Fournier[1] agrees with Hardy in classifying it among the syphilides. Drysdale also[2] is of the same opinion and has given a good description of the disease. But it is nevertheless generally believed to be a variety of leucoderma, and to be rather a consequence of defective nutrition than of the syphilitic virus.

Purpura.—Hæmorrhagic spots on the skin are occasionally seen in syphilitic cases, but the evidence hitherto collected is insufficient to prove that this form of purpura is directly connected with syphilis. Purpura and syphilis may coexist, and probably the syphilitic poison may determine an attack in persons otherwise prone to the affection. Stephen Mackenzie[3] has collected the evidence put forward by Bälz,[4] Behrend,[5] and others respecting this affection, and has narrated some cases observed by himself where a purpuric eruption appeared during the course of secondary syphilis. The skin of the lower extremities is the seat of the eruption. The gums are not markedly, sometimes not at all, affected.

Iodide of potassium is well known to cause purpura in certain persons, and thus many, though not all, of the cases of purpura in syphilis may be explained. This influence of the iodides will be reverted to again in the chapter on "Treatment."

Affections of the Hair; Alopecia.—The hair often falls during the earlier stages of syphilis, a period when the nutrition of the body is much disturbed. It commonly begins between the fourth and sixth months after infection, but may occur at any time up to the end of the second year. This phenomenon occurs also in other diseases, such as typhoid fever, and probably in the same manner. The condition of the scalp appears little changed, but the hairs lose their brilliancy, loosen, and fall, or are dragged out by the brush; if examined, they are found to be shrunken and withered. The hair

[1] Fournier: Syphilis chez la Femme, p. 422.
[2] Drysdale: Lancet. Nov. 17, 1877. See also G. H. Fox (who does not believe it to be directly connected with syphilis): American Journal of the Medical Sciences. April, 1878.
[3] Stephen Mackenzie: Medical Times and Gazette. 1879, vol. i., pp. 173, 279, 501.
[4] Bälz: Archiv der Heilkunde. 1875 (xvi. jahr.), 2 heft, pp. 179—187.
[5] Behrend: Berlin Klin. Wochenschrift. 1878, März 11.

does not always fall at once when it assumes this withered appearance; the individual hairs sometimes remain tightly attached to the scalp for a long time, so that the patient seems to be wearing a wig rather than his own hair.[1] At other times the hair falls only in patches. After a few weeks, new small hairs can be seen growing among the old, but they do not reach a great length before they also wither and drop out. Ultimately new vigorous hairs grow again on the scalp; hence this form of alopecia is not permanent. Shedding of hair is not always confined to the scalp; sometimes the brows and lashes and the pubic hair fall also, and the patient becomes for a time completely bald.

The hair is not necessarily shed when the scalp is the seat of a syphilitic eruption; but this is commonly the case because the hairs are then loosened by inflammation of their follicles, and, adhering to the scabs, are carried off with them. In this way bald places are produced, over which the hair grows again, unless the follicles have been destroyed.

Barlow[2] has pointed out that fall of the hair may take place in inherited syphilis, forming local patches of baldness, which are most characteristic on the eyebrow, though the fronto-temporal region, and less frequently the occipital region, may be denuded. He observed desquamation to precede the fall of hair, in some of his cases.

Affections of the Nails.—Lesions of the nails may be arranged in two groups[3] (a) those which begin in the nail itself or in its matrix—*Onychia;* and (b) those which extend to the nail from the neighbouring skin—*Perionychia.* The first group includes brittleness and notching of the free border; shelling off of the nail; and hypertrophic thickening of the nail.

The brittle condition of the nail is usually present with dry scaling syphilides; hence it is commonly seen during the first, second, or third year after infection. It has a very chronic course, almost always affects several nails at once, and is annoying from the disfigurement which it causes, as well as from the extreme brittleness of the nail, the border of which chips and notches continually, however carefully it may be pared or trimmed down to the quick.

Shelling off of the nail is less common. It consists in gradual separation of the nail from its matrix, beginning at the free border and spreading towards the root. Usually the separation is partial, and affects only the lower part of the nail; but occasionally it

[1] Fournier: Gazette des Hôpitaux. Nov. 25, 1879.
[2] Barlow: Lancet. August 22, 1877.
[3] Fournier's description of the affections of the nails is the most comprehensive which has come under our notice. See Syphilis chez la Femme. 1873, p. 467.

extends under the whole nail which then falls off. Commonly this process is irregular and slow, so that while the separation is approaching the root, the matrix opposite the middle of the nail becomes again united to it, and fall of the nail is prevented. This fresh attachment is marked by a deep groove. In course of time as the nail grows downwards, the adhesion reaches farther and farther until the matrix is again generally adherent; but the nail itself is uneven through the growth of some of its layers being abruptly arrested.

At times the nail falls through cessation of growth at its root. When this happens, a small red surface free of nail is seen at the lunated fold of skin overhanging the nail. This red bare patch gradually increases downwards until the nail, separated from its attachments and no longer perpetuated by new growth, falls and leaves the matrix exposed as a dry red surface.

The hypertrophic form is far more rare than the others. Hard horny growths form in the under lamella of the nail which gradually thicken it irregularly to three or four times beyond its natural dimensions. These horny ridges form mainly at the free border and are rough, jagged and notched while the nail behind them is nearly normal. This affection has by some been termed *psoriasis of the nail.*

Perionychia includes a dry scaling form; an inflammatory form; and an ulcerating form. The scaling form is simply an extension of a scaling papule from the skin to the nail matrix. This thickens, and the nail over it chips and scales so as to make scars or whitish pits on the part of the nail overlying the papule. At other times the overhanging border gets thickened, horny, and easily breaks when rubbed, so that it is rough, irregular, and bleeds on slight injury. The inflammatory form likewise starts with a swelling of the matrix and adjacent skin of dull red colour, thus forming a thickening of the skin around the nail, like that of a whitlow; but it does not suppurate, is very slow in its course, and often causes necrosis of the nail, which turns black, or blackish yellow. By projecting into the swollen skin around it, the nail causes ulceration, the production of fungous granulations, and the discharge of more or less fœtid pus. Usually, when the nails of the fingers are the seat of this affection, little pain is felt; but when the great toe, for example, is attacked, the symptoms of the so-called ingrowing of the nail are marked, and considerable suffering may be caused. If untreated it continues for several months, sometimes forming a projecting mass of granulation overlapping the nail. In course of time the irritation often subsides spontaneously, the swelling departs, and the ulceration ceases; ultimately, though not till long afterwards, the red colour leaves the skin at the border of the nail.

O. Heyfelder [1] has reported a case of gummy disease of the nail-matrix which produced great enlargement of the several finger ends, with fall of the nails and repeated ulceration of the matrix and the neighbouring soft parts, in a patient who ultimately succumbed to his cachexia. The fingers were not examined after death.

Diagnosis.—Syphilitic affections of the nails are distinguished by their multiplicity, chronicity, and the presence of signs of syphilis elsewhere.

General Glandular Enlargement.—During the period of widely-spread general eruption, that is, in the first six or twelve months after infection, even up to the second year according to Fournier, several groups of lymphatic glands, sometimes almost all the groups within reach of examination, become enlarged. This affection of the glands is not necessarily dependent on the eruption, indeed certain groups seldom enlarge, even when the localities with which they are connected are the seat of eruption. For example, the scaly syphilide of the palm does not produce any effect on the glands of the elbow or armpit. Certain other groups appear, on the contrary, to be more or less enlarged whenever the localities whence they receive absorbents are affected. The enlargement is slow, painless, and usually affects every gland in the group concerned. The skin and cellular tissue about the glands are not altered, nor is there any tendency under ordinary circumstances to suppuration or abscess. When well marked, this general glandular affection is usually accompanied by anæmia, and in some patients the spleen is enlarged, and the temperature raised to 101 or 102° F.

The several glands of the body are very variously affected. The group most commonly enlarged is the posterior cervical, along the borders of the trapezius muscle; indeed, in most patients these glands can be detected easily during the first four to twelve months after infection. This group is also easily influenced by the local syphilitic affections of the throat, especially of the pharyngeal mucous membrane. The suboccipital group is another which is almost invariably enlarged when there is an eruption on the scalp, though such eruption is not at all necessary to excite their increase of size. The submaxillary group too is frequently affected; but in this case the condition of the tonsils and pillars of the fauces is usually the exciting cause. The axillary, inguinal, and submental groups are not so often affected, while the epicondyloid, pre-mastoid, and pre-auricular glands are still less frequently altered, though in well-marked cases of syphilitic adenopathy, these are all plainly

[1] O. Heyfelder: Dactylitis S. multiplex. St. Petersburger Med. Wochenschrift. 1870, S. 38.

enlarged. The only group which, according to Auspitz, has not yet been observed to enlarge, is that of the popliteal space.[1]

This increase of size varies much in different persons; in some it is wholly wanting, in others the increase is slight, and limited to one or two groups. It varies from that of a pea or a bean up to that of an almond or walnut. The duration of this painless enlargement also varies. The subsidence of the glands to their natural size is sometimes accomplished in a few weeks, but more commonly requires several months for its complete departure.

Malignant and Precocious Syphilides.—Certain forms of eruption have obtained these names rather from their course than from any peculiarity of the affections developed. Cases of malignant syphilis are characterised by speedy development of the eruptions on the skin after the appearance of the initial lesion, by those lesions appearing in regions not usually attacked by them in ordinary cases of syphilis, and by their strong, almost invariable tendency to suppurate and ulcerate. The prodromal fever is often early and severe. Nocturnal pains in the bones, muscles or fasciæ, are much complained of. Insomnia, prostration, loss of appetite, and rapid wasting are marked symptoms. The eruptions of the skin ulcerate freely on the face, scalp, and lower extremities, and sometimes over the whole of the body; while nodes, osteal necrosis, subcutaneous gummata, iritis, visceral lesions of the liver, brain, spleen or other organs often develope during the first six months after infection. When very severe, specific medicines except in very large doses, sometimes have little or no influence in checking the disease, or render the patient so prostrate that they cannot be borne, and he may even die simply from the exhaustion caused by the extent of the lesions.

Diday[2] and Guibout[3] have recorded such cases, while other instances of less severity have been made the subject of special study by various authors.

[1] Auspitz: Archiv für Dermat. u. Syphilis. 1873.

[2] Diday: Thérapeutique des Mal. Vén. 1876, p. 256.

[3] Guibout: Mal. de la Peau. 1876, p. 541. For essays on this form of syphilis consult Cazenave: Annales des Mal. de la Peau. 1843, p. 27. Bazin: La Syphilis. 1866, p. 367. Taylor: Amer. Journ. Syphil. 1870. Mauriac: Gaz. des Hôp. 1874, p. 603. Ory: Recherches sur les Syphilides précoces. Paris, 1876.

SYPHILIS.

CHAPTER V.

THE ALIMENTARY SYSTEM.

The Tongue.—The tongue is occasionally the site of the initial lesion of syphilis. In such cases it possesses well-marked induration, is single, and forms a shallow or even elevated sore on the tongue usually near its tip; and the lymphatic glands below the angle of the jaw soon become enlarged.

Jullien[1] refers to a case under the care of Hardy in 1874, in which *roseola* of the tongue was diagnosed. The patient, who had at the same time roseola of the skin, presented on the tongue a series of red round patches on which the epithelium was slightly desquamating.

Papules sometimes form on the dorsum of the tongue, and are identical in structure with the papules of the skin. Unless they ulcerate, they produce no inconvenience to the patient. They soon subside under appropriate treatment, and leave no trace behind.

Mucous patches.—During the first or second year after infection, round patches form on the tongue, most frequently at the sides, especially opposite rugged or hollow teeth, should such be present; but occasionally these patches appear on the dorsum linguæ. They form round whitish elevations, which may be either simply eroded or ulcerated more or less deeply. When the patches are numerous the whole mucous membrane of the tongue may be swollen.

Ulcers.—Superficial ulcers along the border of the tongue, sometimes rounded, sometimes forming vertical fissures, are very common in syphilis. They usually appear during the first year after infection, and are particularly obstinate, being often repeated for several months by continual relapses. They are excessively sore, especially

[1] Jullien : Maladies Vénériennes. 1879, p. 737.

if they expose the muscular fibres, when every movement of the tongue causes pain. Less common than these are *sinuous fissures of the dorsum* of the tongue which, by penetrating to the muscular tissue, are extremely painful. They are very characteristic of syphilis, and may continue to harass the patient for many years if not subjected to proper treatment. They are frequently connected with the infiltrating sclerosis of the tongue, to be presently described.

White Patches.—This is a common name for a peculiar hypertrophy of the epithelium of the tongue, usually confined to that organ, but sometimes seen on the interior of the cheeks and fauces. It presents itself as small dead white patches of epithelium, closely adherent to the mucous membrane, but a little raised from the surface. It is an obstinate affection, requiring a long continued course of treatment for its removal. Between the patches, white shining cicatrices of former ulcers are often seen. Usually no pain or tenderness accompanies these patches. Now and then excoriations form on them, that smart exceedingly when hot or acid food is taken.

The foregoing affections are usually met with during the three or four years following infection, though they may reappear many years afterwards. Those next to be mentioned are rarely seen until five or more years after the departure of the general eruptions of syphilis.

Sclerosis and Gumma of the Tongue.—Tertiary affections of the tongue may occur in inherited as well as in acquired syphilis. They may be divided into two varieties; one depends on the production of hyperplasic material, which eventually developes into a fibrous tissue—the *sclerotic* form. The second variety consists in the production of isolated gummy nodules which are identical with gummata of other organs. Fournier[1] has minutely described these affections under the names of *Sclerous Glossitis* and *Gummous Glossitis.*

Sclerosis of the tongue may be superficial or deep. The superficial form consists of a cellular growth in the mucous and submucous tissue forming ovoid or roundish firm dense lamellæ, which are easily detected by the finger. These plates are of various sizes; usually two or three are present together, and their commonest seat is the anterior or middle portion of the dorsal surface. The mucous membrane covering them is darker in colour than elsewhere, and is smooth and shining on the surface, the papillæ being buried in a flat horny layer of epithelium. Sometimes the new growth affects a considerable portion of the tongue's surface, instead of

[1] Fournier: Des Glossites Tertiaires. Paris, 1877.

being developed in isolated patches. In any case, the hardened areas after a time become converted into a tough contractile fibrous tissue which remains permanently, and has no special tendency to ulcerate. It is, however, very common to find ulcers and sinuous fissures on tongues thus affected, but these lesions are due to accidental irritation of various kinds, such as ragged teeth, smoking, &c., acting on the hard and unyielding fibrous structure. The surface of the elevations sometimes becomes granular, while here and there white patches form which are due to closure of the blood-vessels of the part, together with hypertrophy of the epithelium.

The deep or parenchymatous form of sclerosis involves especially the muscular substance of the tongue; nearly always, however, the superficial form is present at the same time. The deep sclerosis is generally more extensive than the superficial as regards the portion of the tongue affected, and produces tumefaction of certain parts of the dorsal surface; but sometimes the tongue becomes enlarged transversely. This increase in volume is often only temporary; indeed, at a later stage the tongue may become even diminished in size, owing to the contraction of the fibrous tissue which results from degeneration of the hyperplasic deposit. The most characteristic sign, however, of the deep sclerosis is an irregular lobulated appearance of the dorsal surface. The prominent lobules are separated by furrows running in various directions, the deepest of these furrows corresponding to the median raphé of the tongue. The portions of the organ thus affected are always much indurated, and the induration is at once felt on examination to be deep in the organ, quite unlike the hard superficial plates of the preceding form of sclerosis. The mucous membrane is of a deeper red than natural in some parts; in others it is paler, or of a dirty white colour. It is also smooth from gradual destruction of the papillæ over nearly the whole extent of the affected parts. Unless gummata are also present, ulceration does not proceed beyond shallow erosion, caused by the chafing to which the rigid and lowly organised tissue is subjected. Fournier has described and figured a case where this interstitial glossitis affected the whole tongue, producing enormous enlargement of the organ. The hypertrophy was in this case divided into two parts by a deep mesial furrow.

Gummata of the Tongue may develope in the mucous membrane or in the muscular substance; they do not usually appear until a late period of the disease, but Mauriac[1] records a case where three or four nodules appeared in the substance of the tongue seven

[1] Mauriac: Myopathies Syphilitiques. 1878, p. 182.

months after infection. When superficially situated they appear as round nodules varying in size from a small shot to a cherry-stone, or even larger. The dorsum and sides of the tongue are their most usual seat, and the nodules are more easily felt than seen. There may be one or several. Those which begin deeply are well-marked examples of muscular gummata;[1] usually beginning at no great distance beneath the dorsum, as they develope they approach the surface, but often attain a large bulk before they cause much projection. They usually vary in size from a small bean to an almond, or even larger. Searched for by the finger they are easily detected, and fairly well defined. The course of the gummata whether superficial or deep is very similar. First growing as firm hard nodules, next softening into a gelatinous consistence, finally exciting absorption of the contiguous tissue and causing ulceration when the surface is reached. The ulcer appears first as a small round hole which rapidly enlarges eccentrically and exposes a deep somewhat irregular cavity partly occupied by yellow sloughy tissue, from which a thin fluid escapes. The last stage is that of cicatrisation, the irregular hollow becomes lined by smooth granulations, grows shallow and heals with a depressed scar. This scar, in any future revival of the disease, is apt to thicken and ulcerate by an imperfect repetition of the process.

Diagnosis.—The initial lesion of the tongue is distinguished by its being single, by the submaxillary glandular enlargement, by the absence of any other syphilitic disease of the tongue, by the history of the case, and by the absence of initial lesion on the genital organs or elsewhere.

Syphilitic papules are distinctly circumscribed, are accompanied by syphilitic disease elsewhere, and are readily influenced by treatment.

A ragged tooth sometimes causes an ulcer on the part of the tongue chafing against it, but such ulcers exactly correspond to the irritating projection and are readily healed by removing or filing away the tooth and keeping the mouth clean.

The diagnosis of the superficial ulcers depends on their fissure-like form, and on the history of bygone or actual presence of other syphilitic affections. The pearly aspect and general whiteness of the epithelium in common lingual psoriasis will distinguish it from the syphilitic affections.

Smoker's Patch.—In certain persons who have smoked or chewed tobacco assiduously, an affection of the epithelium of the tongue and buccal membrane that resembles syphilitic disease is produced.

[1] They have been well described by Bouisson, Gaz. Méd. de Paris. 1846; by Ricord, Traité des Mal. Vén. 1858; and especially by Lagneau, Archives Générales de Médecine. 1860, t. i.

Where these patches form, the tongue is uneven or granular on the dorsum, and slightly rugous or papillated at the borders, especially near the tip. These spots or patches are of dense white colour; usually causing no pain, they are at times tender and sore, or even clearly excoriated. They are often present in persons who have syphilis though they may be developed quite irrespective of that disease. The main distinctions of these patches are:—first, their extreme whiteness, causing them to resemble the marks made by lunar caustic; second, their suppleness, for they do not cause hardness or lobulation of the dorsal covering; thirdly, the white patches are most common near the tip of the tongue, *i.e.* where the cigar or pipe most frequently touches; fourthly, the tongue is rarely, if ever, the sole seat of the patches, the mucous membrane inside the angles of the mouth and also of other parts of the buccal surface being similarly affected. When both syphilis and tobacco have been simultaneously at work, both affections of the tongue may be present. In such cases it may be impossible to distinguish how far the affection from which the patient suffers is of syphilitic origin.

The so-called *Icthyosis* of the tongue, a disorder that consists mainly in overgrowth of the papillæ and epithelium, is said to have occasionally a syphilitic origin. It has been described by Fairlie Clarke [1] and others, and is distinguished from true syphilitic affections by the history of the case and by the absence of the contracting indurated tissue or deeply-set ulcers of syphilitic sclerosis.

Phthisical ulcers of the tongue.—Attention has been drawn by Ricord,[2] Trelat,[3] Fournier,[4] Nedopil,[5] and others, to the irregular thickenings that are sometimes observed on the dorsal surface of the tongues of tuberculous patients. These growths here and there break into hollow ragged sores, or form lobular projections. They so closely resemble syphilitic ulcers that they can be best distinguished by referring to the patient's general condition. Trelat has pointed out that occasionally little greyish granulations (tubercles?) may be detected in the epithelium of the tongue near the hardened ulcerated surfaces, which, when present, are diagnostic. Fortunately tuberculous disease of the tongue is a very rare affection, and the symptoms of tuberculous disease elsewhere will assist the diagnosis.

Epithelial cancer of the tongue can only be confounded with

[1] Fairlie Clarke: Diseases of the Tongue. 1873; and Medico-Chirurg. Trans. 1874, p. 155.
[2] Ricord: Phthisie Buccale.
[3] Trelat: Archives Générales de Médecine. 1870, t. i.
[4] Fournier: Glossitis Tertiaires, p. 58.
[5] Nedopil: Archiv f. Klin. Chirurg., Bd. 20; and Brit. Med. Journ. 21 July, 1877.

gumma when the latter has ulcerated. Even in such cases epithelioma is commonly distinguished by hard infiltration spreading widely beneath the ulcer, and by the elevated borders of the sore. Cancer is also commonly met with in persons more than forty-five years old; whereas syphilitic disease, being so often contracted in adolescence, in the majority of cases developes its later effects before forty. A most important symptom is the shooting pain which commonly accompanies cancer of the tongue. The pain of syphilitic tumours has never this character; it is rather a sensation of soreness, or impediment to mastication and speaking, produced by the bulk of the tumour in the tongue's substance. The submaxillary glands are always enlarged during some part of the progress of cancer, often early. In ulcerating gumma they are usually not at all affected, and if slightly swollen by irritation of the ulcerated surface they are not hard as well as enlarged. In cancer also the tongue is often much limited in its movements by extension of the growth to the floor of the mouth. This loss of mobility is rare in syphilis. Zeissl[1] points out that in cases of epithelioma, small sebaceous plugs can be sometimes squeezed out of the indurated mass, but this is never the case in syphilitic disease. Hutchinson[2] has drawn attention to the occasional growth of epithelial cancer in tongues previously hardened and scarred by syphilis, as an additional cause of difficulty in the diagnosis; thus it comes to pass that, however plain the distinctions between cancer and syphilis are in most cases, there are some in which the diagnosis is impossible until there has been an opportunity of testing the influence of iodide of potassium on the growth.

The Mouth and Pharynx.—The initial lesion is occasionally met with on the gum or buccal surface or tonsil. Diday[3] has written a long paper on primary sores of the tonsil, and gives details of eight cases in which he thinks the initial lesion was situated on this gland. He, however, only actually saw the primary lesion in four of the cases. Diday attempts to explain its occasional appearance on the tonsil by the act of suction which takes place during kissing, and the ready reception and retention of the poison by the large lacunæ of the tonsil. Mackenzie[4] states that he has met with seven examples of primary syphilitic sore of the tonsil, six of the patients being women; but he does not give any particulars of the cases.[5]

One mode of contagion in such cases has unfortunately been by

[1] Zeissl: Lehrbuch, edition of 1872, S. 203.
[2] Hutchinson: London Hospital reports for 1866.
[3] Diday: Etude sur le Chancre de l'Amygdale. Mémoires et Comptes-rendus de la Société des Sciences Méd. de Lyon, t. i. 1861—62, p. 45.
[4] Morell Mackenzie: Diseases of the Throat and Nose. 1880, vol. i., p. 87.
[5] See also Schirajew (Moskow): St. Petersburg. Med. Woch. 1880, No. 39.

means of the Eustachian catheter. This happened several times in France not many years ago, and it has also occurred in this country. Occasionally, direct contagion inside the mouth occurs from unnatural practices.

Diagnosis.—The chief points in the diagnosis of the initial lesion of the mouth or tonsil are the singleness of the sore, its indolent character, its hard base, and the enlargement of the submaxillary glands. The appearance of signs of general syphilis when the period of incubation has elapsed will of course decide the question.

The secondary affections of the mouth and pharynx closely resemble those of the skin, but are not so various. The mouth and fauces are in nearly all syphilitic patients the seat of repeated eruptions during the course of the malady, while the pharynx is comparatively seldom attacked, though even in this part all the various affections of the mucous and submucous tissues may be developed.

The erythematous eruption corresponds to the roseolous eruption of the skin; it spreads over the fauces and velum as a general reddening of those parts, causing a slight sensation of dryness of the throat, and pain in swallowing. The uvula swells, and by hanging down increases the discomfort. Sometimes the inflammation extends to the pharynx; but it has not been traced further than this along the alimentary canal. According to Türck, the nasal mucous membrane is occasionally attacked by extension through the posterior nares, and acute bronchitis is said sometimes to accompany the erythema in the pharynx. This rash on the fauces usually appears with the eruption of the maculæ on the skin. Pillon[1] observed this erythema sixty-five times in 114 cases of early syphilis. It does not last long, and after a few days the mucous membrane regains its normal condition. Now and then the congestion is sufficient to cause slight excoriation of the inflamed surface, but this readily heals as the congestion subsides. In certain cases, however, the erythema remains until mucous patches develope on the anterior pillars and velum palati, when these affections appear earlier than usual.

Wendt[2] describes a catarrh of the lower part of the pharynx as an occasional phenomenon in early syphilis. It closely resembles ordinary catarrh and its syphilitic origin is, in our opinion, doubtful.

Mucous Patches or Mucous Tubercles are among the most common of the early syphilides of the mouth and fauces; indeed very few patients escape them altogether. They appear during the first few months after infection, and usually follow in point of time the early

[1] Pillon: quoted by Lancereaux, Loc. cit., p. 128.
[2] Wendt: v. Ziemssen's Cyclopædia of Med., Eng. Transl., vol. vii., p. 79.

roseola of the skin. They constitute a common form of relapse in syphilis, hence they may be developed even many years after infection. They appear as slightly raised whitish patches, inclining to circular in shape, excoriated at the centre, and often surrounded, especially on the velum and pillars of the fauces, by a broad red areola. They seldom ulcerate deeply, and after some weeks' duration spontaneously heal and leave no trace. Most common on the anterior pillars and velum, they are not infrequent at the angles of the mouth inside the lips or behind the last molar teeth of the lower jaw. At the angles of the mouth they are apt to be divided by a fissure of which the swollen white borders are very characteristic.

Ulcers.—Small shallow ulcers of the mucous membrane of the mouth and throat are very common during the earlier stages of syphilis. They are not placed on a papule, being simply roundish excoriations with sharply-cut uneven borders. The mucous membrane around them is somewhat reddened, but not thickened. Their surface is covered with a greyish exudation. They are seen at the angles of the lips, on the inside of the cheeks, but by far most commonly on the pillars of the fauces and the tonsils. They rarely reach the pharynx. The tonsil is also sometimes the seat of a deep sharply cut ulcer surrounded by a dark areola. Such ulcers are very liable to slough, and thus considerable destruction of tissue may take place. Only one tonsil is usually affected.

Tanturri[1] has described an affection, which he terms lymphadenoma of the tonsils and follicles of the root of the tongue, that may develope in syphilis without any congestion or irritation of the fauces generally. The infiltration consists of ordinary adenoid hypertrophy of the tonsils singly or together, or conjointly with a like change in the follicles at the base of the tongue. The parts so affected are prominent, smooth and elastic at first, but eventually become hard, irregular, and contracted. The affection is usually met with in cases of general enlargement of the lymphatic glands throughout the body. Their superficial position, sinuous inequalities, and general elastic resistance distinguish these growths from gummata.

Tertiary affections of the mouth are almost completely limited to the hard palate and velum. The mucous membrane of the cheeks and jaws is very rarely affected by the late forms of syphilis, except by extension from the neighbouring parts. Eroding ulceration of the gum, exposing the alveolar border of the jaw with necrosis, is occasionally seen. This is identical with the eroding serpiginous

[1] Tanturri: Giornale Ital. delle Mal. Ven. e della Pelle, iv. 1872.

ulceration of the hard palate, which is sometimes connected with disease of the bones.

Serpiginous ulceration begins usually at or near the gum behind the incisors, and spreads slowly over the mucous membrane; the ulcerating line is marked by an irregular slightly raised border, while the parts first attacked are covered with a firmly adherent depressed scar. The ulcerated part is tender and sensitive, making the act of chewing tedious, and the ingestion of pungent food, wine or spirits, painful. This disorder is most common four or five years after infection, though it is not unknown during the first and second years. It is seldom the sole sign of syphilis, but when this is the case, may be recognised by its serpiginous action, a character never attending cancer.

Ulceration of the *pharynx* is not common until several years after infection, but we have seen cases in which ulcers developed on its posterior wall during the first three or four months. In these cases the patients were cachectic and showed other grave forms of disease, such as rupia and other symptoms which usually occur only in the tertiary stage.

Tertiary affections of the palate so rarely fail to implicate the fauces and pharyngeal wall that it is expedient to describe the later lesions of these regions together.

As in the tongue and elsewhere, the affections have two forms: the diffused infiltration and the circumscribed gumma.

The diffused form developes in two varieties; one limits itself mainly to the mucous membrane, the other penetrates the submucous and muscular tissue.

The superficial variety produces thickening of the mucous membrane, which ulcerates almost as rapidly as it is produced, forming shallow sores with sharply cut edges, which creep over the surface of the velum along the anterior pillars to the fauces, or outwards to the mucous membrane reflected over the jaws behind the molar teeth. There is usually little pain beyond soreness during mastication and deglutition. When healed, it leaves wide-spread branching scars; but if the deeper layers have escaped, the parts retain their mobility, and apparently lose little of their functions. The scars, when once completely healed, have little tendency to break down.

The penetrating variety behaves very differently. It converts all it reaches into a tough brawny tissue, and its progress is difficult to arrest before the whole velum and pharynx have been essentially altered in form. At the outset the parts are much thickened, partly by œdema, but chiefly by the new hyperplasic material. This thickening greatly hampers the action of the muscles, and thus the power of speaking and swallowing is quickly affected. Usually

beginning in the pillars and velum, the infiltration speedily spreads to the walls of the pharynx, and a considerable surface is invaded before ulceration begins. But sooner or later the surface breaks, usually at several points, and a group of indolent uneven ulcers produced, healing in some places while spreading in others, and covered with sticky muco-pus or brown crusts of dried mucus. The healing process is also peculiar. The infiltration is slowly transformed into a tough highly contractile fibrous tissue, of which the only covering is a friable epithelium which is readily chafed away, leaving shallow indolent sores.

The consequences of this morbid alteration are pain, deformity, and more or less loss of function. The pain begins very early, varying in amount according to the situation of the contraction. It is aching, and even lancinating, radiating from the throat to the ears and teeth, &c. Even when the lancinating pain has abated, the effort of uttering more than a few words brings a sense of fatigue from the impediment to muscular action. The voice is thick and husky at first, becoming hissing or hoarse when contraction is advanced, the larynx being commonly implicated by extension of the disease. When the infiltrating growth spreads to the Eustachian tubes they may be occluded or constricted, so that deafness and noises in the ear are frequent. Furthermore, the new growth may reach the posterior nares and, denuding the delicate bones, may cause their necrosis, even if syphilitic osteitis do not attack them also. The ulcerating action sometimes extends to the base of the skull or to the vertebræ; and thus may occasion post-pharyngeal abscess, or cause irritation of the spinal cord. In fine, the bones of the nose, the sphenoid, the palate, the basilar part of the occipital bone, or the bodies and processes of the upper cervical vertebræ may be cleared away. The disease excited in the bones of the skull may extend through to the dura mater, and give rise to epileptiform fits. This was the case with a patient who had suffered during twelve months from tertiary syphilis, extensive ulceration of the palate, pharynx, and larynx. After he had taken large doses of iodide of potassium the ulcers healed, except one spot at the top of the pharynx, where the pharyngeal mirror showed the bone to be exposed. During the time which elapsed before the exfoliation of this necrosed bone, the patient had three severe epileptiform fits. He then took seventy-five grains of iodide of potassium per diem, on which the bone healed, and the fits were not repeated.

Sometimes the ulceration reaches large blood-vessels and occasions dangerous hæmorrhage. Mackenzie[1] relates the case of a

[1] Morell Mackenzie: Medical Examiner. Aug. 29, 1878, p. 123.

woman who lost a quart of blood from the pharynx, and subsequently coughed up the transverse process of the second cervical vertebra, suggesting that the vertebral artery had been opened. Landrieux[1] has recorded a fatal case of hæmorrhage where, post-mortem, the internal carotid artery was found to have been opened. Another effect is sometimes produced by the contracting scars. The remnant of the velum may become adherent to the pharynx or to the base of the tongue, or bands may form between the pharynx and the fauces.[2] Usually there is left a gap in the centre, large enough for the forefinger to enter, by which communication between the nose and the pharynx is still possible. But sometimes this aperture is very small, and may even become completely closed, so that air can reach the lungs through the mouth alone.[3] In other cases the isthmus faucium is replaced by a gristly ring, which draws up and holds almost immovable the root of the tongue and remains of the epiglottis.

A case of extreme stenosis of the pharynx is related by Gilbart Smith and Walsham.[4] A woman, aged 47, who contracted syphilis twenty-six years before, had for six months been unable to swallow food, and for two months had suffered from severe dyspnœa. The right posterior pillar of the fauces was adherent to the posterior wall of the pharynx, and the uvula and part of the velum had disappeared. On laryngoscopic examination, the epiglottis and vocal cords could not be seen, but an opening, one-eighth of an inch in diameter, was visible at the bottom of a depression towards the left of the middle line. This aperture was the only entrance to the larynx and œsophagus. The woman was relieved by incisions and dilatation, tracheotomy having been previously performed.

The circumscribed gumma is perhaps more frequent than the diffused form, though both are often met with in the same patient. The growth may be single or multiple—more often the former. Insidious in its progress, it usually does not attract attention until it ulcerates. In the velum it may form at any part, though generally near the hard palate. In the pharynx it has no special seat. Beginning in the submucous and muscular tissue, it forms a solid mass, seldom larger than a cherry, but it may grow as big as a hen's egg. Fournier[5] relates a case where respiration and deglutition were almost wholly prevented by such a mass, which was, however, quickly absorbed by means of iodide of potassium. If untreated, the tumour softens, the superficial part ulcerates, and a round gap

[1] Landrieux : Bulletin de la Soc. d'Anatomie de Paris. Juillet, 1874.

[2] Schech has written an exhaustive essay on syphilis of the pharynx and œsophagus in the Deutsches Archiv f. Klin. Med. 1876, xvii. 2 and 3.

[3] See cases by Bradley : Lancet. 1872, vol. i., p. 82. Tobold : Deutsche Klinik. 1874, p. 206. Mauriac : De la Syphilose pharyngo-nasale. Paris, 1877. Also West : Lancet. 1872, vol. ii., p. 291.

[4] Smith and Walsham : Lancet. April 17, 1880.

[5] Fournier : Annales de Dermatologie et de Syphiligraphie. 1873—4. No. 6.

is formed through which the softened matter escapes as viscid pus. The edges of the ulcer which is left are characteristic; they are raised, thickened, reddish, forming a kind of frame to the sore. Sometimes the gap thus formed is enlarged by infiltration and subsequent phagedæna of the neighbouring tissue; sometimes, on the other hand, the borders of the gap heal, leaving a simple hole in the healthy supple tissue of the velum. When this hole is large, fluids escape into the posterior nares during swallowing, and the voice has a nasal twang, but when small, usually no inconvenience is experienced by the patient. The circumscribed gumma in the pharynx leaves only a depressed scar.

Owing to the difficulty of observing the condition of the posterior aspect of the velum and of the upper parts of the pharynx, lesions in those localities are seldom detected until ulceration is far advanced. But the following symptoms demand an examination with the rhinoscopic mirror: dryness and discomfort in the pharynx, a frequent call to clear the throat of a viscid mucus, pain in swallowing, humming in the ears, obstinate coryza, and, after ulceration has begun, pus and streaks of blood in the discharge from the nose. Redness and stiffness of the velum is suggestive of ulceration of its posterior surface.

The Œsophagus.—Cases of dysphagia occurring during the presence of other syphilitic affections have been described by Follin.[1] In one case the difficulty in swallowing disappeared altogether with the subsidence of a palmar eruption; the other was not relieved till specific treatment had been employed. Godon[2] attributes to syphilitic disease of the gullet a case of dysphagia and other clinical signs of stricture which were removed by iodide of potassium.

Alfred Luton[3] relates the case of a man, aged 40, who was affected with progressive wasting and extreme weakness, following upon great continuous dysphagia, for which dilatation by means of bougies had been vainly tried. The patient's previous history suggested the possibility of syphilis, and the daily administration of forty-five grains of potassic iodide quickly dispersed all the symptoms.

Permanent stricture follows severe syphilitic ulceration and contraction of the scars, but syphilitic lesions of the œsophagus are, compared with those of the pharynx, excessively rare. West[4] has reported three cases of stricture in this situation. In two he found the gullet contracted by tough fibrous cicatrices resembling those produced by syphilitic ulcers of the pharynx and elsewhere.

[1] Follin: Pathologie Externe, vol. i., p. 696.
[2] Godon: Archives of Dermatology, vol. i. p. 276.
[3] Luton: Nouveau Dictionnaire de Méd. et de Chirurg. pratique, Art. Œsophage, tom. xxiv. 879, p. 403.
West: Dublin Quarterly Journal of Med. Science. 1860, Feb. and Aug.

Virchow[1] describes a specimen of an ulcerating gummy nodule together with rough contracting scars. Wilks[2] also has met with cases of stricture of the œsophagus in syphilitic persons. The pathological changes in these cases appear to be identical with those observed in the larynx and pharynx; namely, the formation of gummy nodules and fibrous induration in the submucous tissue, which slowly degenerate, ulcerate, and finally heal into rigid contracting cicatrices. The seat of stricture appears variable. In one of West's cases the stricture was at the lower part, in another at the upper part of the gullet. In Virchow's and Wilks' observations, the stricture was in the upper part also. Lancereaux[3] has collected cases of a doubtful kind where stricture of the œsophagus was attributed to syphilis. Habershon[4] describes three cases of syphilitic disease. Other cases of more doubtfully syphilitic origin are reported in various journals.

Functional derangement of the Alimentary Canal.—In the early secondary period these derangements are occasionally met with. They are, according to Fournier,[5] more frequent in women than in men. Those who suffer from these derangements usually have the outward affections ill-marked. Loss of appetite, even to complete inability to take food, is sometimes the most prominent symptom. The contrary condition, excess of appetite, '*boulimia*,' is much more rare; nevertheless, Fournier noted sixty cases at the Lourcine Hospital in six years. It varies from a slight exaltation of the appetite to a raging inappeasable hunger, when the patient eats everything edible within reach, and if his cravings are supplied will eat for days or weeks together three times the quantity usual for an adult in full health. Sometimes this enormous ingestion of food appears to cause no inconvenience; the tongue remains clean, the bowels regular, and no uneasiness of the abdomen is felt. Usually, however, the various symptoms of dyspepsia, flatulent distension, diarrhœa, &c., are quickly manifested. Fournier points out that boulimia is often attended by febrile disturbance, headache, nausea, pain in the limbs, and high temperature (102° F.), and still more often is *great thirst*, '*polydipsia*', so that the patient drinks quarts of fluid daily to assuage a thirst which has no obvious cause. Another functional disturbance is *chronic vomiting*. Sometimes particular articles of food are thrown up; in a few cases every form of food is rejected as soon as swallowed. The course of these derangements is very similar. They appear during the first six

[1] Virchow: Krankhafte Geschwülste, Bd. ii., S. 415.
[2] Wilks: Guy's Hospital Reports, vol. ix., p. 41. 1863.
[3] Lancereaux: Traité de la Syphilis. 1873, p. 246.
[4] Habershon: Diseases of the Abdomen. 3rd edition, 1878, p. 73.
[5] Fournier: Syphilis chez la Femme. 1873, p. 906.

months after infection, beginning a little before the outbreak of the first rash on the skin, and lasting for a time that varies in different patients from a few days to several months. They cease spontaneously, and apparently without regard to anti-syphilitic remedies.

Peritonitis.—Multiple adhesions, connecting together the viscera or attaching them to the diaphragm or the abdominal wall, may occur in syphilis. Usually limited to a few bundles of white fibrous bands, the connections may be so numerous as to enclose the liver, spleen, and intestines in an inextricable net-work.[1] Simpson,[2] and v. Bärensprung[3] remarked the peritonæum to be thickened and fastened by adhesions to the several viscera in children born of syphilitic mothers, or who showed clearly syphilitic affections of the liver. Lancereaux records a remarkable case of Hérard's of an adult, and alludes to those mentioned by others. There is, however, nothing peculiar to syphilis in this peritonitis.

The Stomach and Intestines.—The syphilitic diseases of the alimentary tube are still very imperfectly known. Andral,[4] Trousseau[5] and others describe instances of obstinate vomiting, epigastric tenderness, &c., being readily cured by mercury in persons who either had syphilitic affections present elsewhere, or had previously suffered from syphilis. Wagner[6] and Lancereaux[7] describe submucous induration, and Frerichs has noted amyloid degeneration in the coats of the stomach and intestines. Lancereaux has also found an ulcer of the pyloric end in a patient who had well-marked syphilitic disease in the liver and testis. Cornil[8] gives full details of the post-mortem examination of a patient who had gummata of the liver and of the stomach; these tumours were situate near the pylorus in the submucous tissue, as flattened chestnut-like masses, one two inches, another one inch and a quarter in diameter. The microscopic examination of these masses showed them to be identical with gummata of other regions. Engel[9] and others have noted ulcers and scars of the stomach and small intestine in patients with syphilitic disease of other organs. Engel, indeed, says that ten per cent. of ulcers of the stomach have been preceded by syphilis; but he gives no special description that justifies him in assigning to syphilis the

[1] Lancereaux: Loc. cit., p. 255.
[2] Simpson: Obstetrical Works, vol. ii., pp. 157 and 162.
[3] v. Bärensprung: Die hereditäre Syphilis. 1864, prop. ii. See also, Murchison: Lancet, 1861, Nov. 30. And Wagner: Archiv der Heilkunde. 1863.
[4] Andral: Clin. Médicale, vol. iv. p. 138. 1835.
[5] Trousseau: Traité de Thérapeutique, vol. i. p. 230.
[6] Wagner: Archiv der Heilkunde. 1863.
[7] Lancereaux: Loc. cit., p. 248.
[8] Cornil: Leçons sur la Syph. 1879, p. 406.
[9] Engel: Quoted by Brinton, Diseases of Stomach. 2nd edition, 1874, p. 155.

power of frequently causing gastric ulcer. Klebs[1] also has noted gummy ulcers of the submucous tissue of the stomach, small intestine, and rectum. Schwimmer[2] relates the case of a child who at six weeks old had a macular syphilide, and at nine weeks old was seized with diarrhœa, abdominal distension, bloody and rice-water stools, and other signs of enteritis. The symptoms resisted ordinary treatment, but were quickly quelled by mercuric inunction. Hedenius[3] reports a post-mortem examination of a woman who died with rupia, condylomata, and cranial syphilis, in whom was found amyloid disease of the mucous membrane of the small intestines with superficial ulcers of the cæcum.

Oser[4] and Meschede[5] have reported cases of ulceration of the small intestine in syphilitic patients; some being adults, and others new-born children. In each case there were circular ulcerations of Peyer's patches and other parts, affecting all the coats of the bowel, and causing adhesion of the serous surfaces. The origin of the ulcers was attributed to syphilis for want of any other recognised cause. There was no appearance of tubercle while there was clear evidence of syphilis in other organs. Besides his own cases, Oser has collected several instances recorded by other observers of ulceration of Peyer's patches in syphilitic subjects.

Laurenzi[6] has reported a condition of the small intestine which he found in a woman who, four years before her death, had been infected with syphilis, and at the time of her death had gummata of the back. There were numerous adhesions of the serous surfaces of the liver and intestines, and the small gut, for a considerable part of its course, was alternately narrowed and dilated. The narrowing was cylindrical or spindle-shaped. The submucous and subserous tissue was beset with small yellowish nodules, so numerous as to induce Laurenzi to liken them to the spots of *variola discreta*. No ulcers or cicatrices were found. The large intestine was normal. The other organs were healthy, and there was no evidence of tubercle. The syphilitic origin of this condition of the small intestine nevertheless, in our opinion, remains doubtful.

The great intestine has been found to be the seat of ulcers along its whole length in persons who had had long-standing syphilis. Cullerier[7] relates the case of a woman in whom round ulcers and scars

[1] Klebs: Handbuch der Pathologischen Anatomie. 1869, S. 261.
[2] Schwimmer: Archiv für Dermatologie u. Syphilis. 1873, S. 247.
[3] Hedenius: Upsala läkare för forh., Bd. X., S. 485. 1875.
[4] Oser: Archiv für Dermatologie und Syphilis. 1871, I.
[5] Meschede: Virchow's Archiv. 1866, Bd. 37, p. 567. See also Eberth: Virchow's Archiv. 1867, Bd. 40. In Eberth's case, p. 326, the affection of the intestine is of very doubtful origin.
[6] Laurenzi: Entero-Peritonite gommosa sifilitica. Giorn. Ital. delle Mal. Ven. e della Pelle. 1871, tom. 2, p. 298.
[7] Cullerier: L'Union Médicale. 1854, No. 137, p. 554.

were found throughout the great intestine. Some of the ulcers had hard bases, and some laid bare the muscular coat. The stomach and small intestines were healthy. This patient had suffered one year before from gummata of the skin, and tertiary disease of the velum and of the tibia. According to Jullien,[1] Leudet has reported a case of ulceration of the colon with fibrous stricture so tight that the point of the finger could only just enter it.

The Rectum and Anus are the seat of some syphilitic affections which have special characters. Thus, they have obtained special notice among syphilitic visceral disorders, and have been variously described. The most systematic and correct account which has yet been drawn up is that of Fournier,[2] whose classification is adopted in the following description. So far as observation has yet recognised them, they are all phenomena of the late periods of syphilis, if the occasional occurrence of the primary sore at the anus and margin of the rectum be excepted.

In the Rectum, the lesions consist of ulcers, gummata, and infiltrating contractile sclerosis. *The ulcerating form* is limited to the mucous membrane of the lowest part of the gut, and is generally an extension into the rectum of the same process at the anus. When limited wholly to the rectal mucous membrane, they closely resemble the ulcers already described as forming along the course of the great intestine. The ulcers do not usually extend more than an inch or an inch and a half upwards, but Fournier has noted two cases where they reached further than he could see by the aid of a Sims's speculum. The symptoms, course, and termination of these ulcers are very similar to those found when the affection is situate about the anus. They are rare affections and usually develope in the fourth or fifth year after infection.

Circumscribed Gummata of the rectum are of excessive rarity. Fournier refers to a case published by Verneuil. Zeissl[3] has recorded the history of a man, suffering from syphilitic sarcocele, who had also a doughy swelling as large as a walnut in the rectum. Ultimately this swelling broke and discharged pus and sloughy tissue; the resulting cavity finally healed under iodide of potassium. The same author[4] relates two instances of tertiary ulceration of the rectum in women, which probably originated in circumscribed gumma. One of these women died with syphilitic disease of the bones, brain, liver, and other organs; but the other recovered. Zappulla[5] has reported a case of contraction of the anus in a male patient aged 36,

[1] Jullien : Loc. cit., p. 850.
[2] Fournier : Lésions tertiaires de l'Anus et du Rectum. 1875.
[3] Zeissl : Vierteljahresschrift für Derm. und Syph. 1875, S. 137.
[4] Zeissl : Allgemeine Wiener Med. Zeitung. 1876, Nos. 30 and 31.
[5] Zappulla : Annali Universali de Medicina. Milano, 1870, tomo 213, p. 157.

where a circumscribed swelling the size of a hazel-nut was found at a distance of an inch and a half above the anal orifice. The speculum showed that the rectal mucous membrane, as far as could be seen, was hypertrophied and studded with small projections. The affection, which occurred about nineteen years after his supposed infection with syphilis, had existed only a month before the patient came under Zappulla's observation. After three months' treatment with large doses of iodide of potassium the patient completely recovered.

Infiltrating sclerosis.—This, the most important form of tertiary disease of the rectum, is that which causes severe stricture. It has been described by Fournier as *Ano-rectal Syphiloma*. It consists of an infiltration of hyperplasic material into the submucous cellular tissue in the first instance, and thence gradually extending throughout the walls of the rectum and anus. After a time, this new formation degenerates into a retractile fibrous tissue of low organisation. In the rectum, where it is more frequent than at the anus, it causes a rigid thickening of its walls, but the mucous membrane in the early stage remains healthy. The lower part of the rectum, that immediately contiguous to the sphincters, is exclusively affected, the sclerosis being limited to the last two, or at most three, inches of the bowel. The neoplasm always affects the whole circumference of the gut. This regular, rigid thickening of the walls of the rectum, evenly infiltrating the whole circumference, but abruptly limited to the lower part of the bowel, reaching its full development before the mucous surfaces are ulcerated or even altered in their condition, is most characteristic of the disease. In the early stage, the rectum, though not strictured, is less elastic than natural; but the impediment to its function is so small that it gives rise to little or no inconvenience. Consequently, the condition of the rectum before contraction is very rarely seen by the surgeon, as it may exist for a considerable time before it induces the patient to apply for treatment. Probably this explains why the affection is so often overlooked in the early stages, when anti-syphilitic remedies would be of the greatest value. The anatomical structure of this growth has thus far been only imperfectly demonstrated, but there is little reason to doubt that it is essentially the same as that which attacks the fauces and pharynx.

As contraction advances, folds of the rectum at the indurated portion become eaten away by sharply cut greyish ulcers, in some of which granulations spring up when healing commences. The course of these ulcers is nevertheless only fitfully towards cicatrisation, they rather tend to break down the whole thickness of the gut, exciting abscesses around the indurated portion, which form fistulæ into the vagina and buttock.

The Anus.—In this region the syphilitic affections of the early

periods appear to be limited to the initial lesion, a rare occurrence, and mucous patches, a very frequent affection of the outlet of the bowel and its borders. They have already been described among the diseases of the skin.

The late affections of the anus are rare in any form, and generally assume that of ulcers of moderate depth; circumscribed gumma of the anal region being of extreme rarity. The ulcerative form may begin at the margin of the mucous membrane, but much more frequently it spreads thither from the surrounding skin. The shape of these ulcers is peculiar, taking the direction of the anal folds. Thus they are elongated or fissure-like, or so folded up that their edges are opposed and their actual size is not recognised until the folds of skin are drawn asunder. They form yellow or reddish yellow sores. The skin itself is for some distance around them dull red, thickened and brawny. These sores cause considerable heat and discomfort, and severe pain during defecation; and when they reach into the rectum, not unfrequently tenesmus. From being continually irritated by movement and by discharges from the bowel, they are most intractable.

Gumma at the anus in the circumscribed form is excessively rare; we have never seen it in the male. In the female it has been observed, though usually the gummy masses which afterwards break down into hollow irregular cavities are developed in the midst of areas of the infiltrating form to be presently described. The following is an example of a circumscribed gumma with little or no production of contractile tissue.

A woman, between 40 and 50 years old, who came under my care at the Lock Hospital, had suffered, before the outbreak of the affection of the anus and buttock, from tertiary disease of the palate, nodes of the tibia and other bones. When she applied for relief she complained of headache, worse at night; and she was thin, pale, and cachectic. On the right side of the anus, and extending over the buttock for about three inches, the skin was dull-red, raised, and brawny. At the margin of the anus, over an area as large as a florin, was a ragged, excavated sore, the floor of which was glazed and yellowish, and partly covered by brown crusts. On examining the rectum, the thickening passed upwards on the right side as far as the upper border of the internal sphincter; but was limited entirely to that side. The ulcer reached inwards nearly as high as the thickening. It laid bare the muscular fibres of the sphincter, which were soaked in thick pus.—B. H.

It rarely happens that the anus alone is attacked by the infiltration, though the anus sometimes escapes when the rectum is the seat of the disease. Usually, the rectum and anus are continuously affected; but in rare cases there is an interval between the sclerosis of the rectum and that of the anus. The infiltrating hyperplasic material developes in the subcutaneous cellular tissue and skin, and

indurates into hard contractile masses of reddish-grey colour and uneven surface. At times, before ulcerating, they produce flattened firm elevations which are divided from each other by deep furrows. These elevations may form round the anus, without implicating the perinæum and vulva (for this is particularly a disease of the female sex). More frequently, however, they are results of extension of the process which had begun at the fourchette and lower part of the vagina. In such cases, the hardened ridges often break down into obstinate sinuous ulcers which are slow to heal and often excite considerable suppuration of the vulvo-vaginal mucous membrane, besides abscess or fistula in the perinæum or buttock, or between the vagina and rectum. Of long continuance, this lesion causes considerable deformity, and when cicatrisation has taken place, the hard unyielding scars break down again on the smallest irritation.

Strictures of the Rectum may be divided into those caused by cicatricial shrinkage and those due to infiltrating sclerosis.

Cicatricial stricture from syphilis is very rare, and is the result of contraction of the scars of tertiary ulceration. By these scars, a band or even a ring or valve of fibrous tissue implicating no great extent of the anus, or of the rectum contiguous to the anus, is produced. There is no authentic record of a primary syphilitic sore causing stricture; but local chancres attended by phagedæna may do so. Erskine Mason [1] states that stricture of the rectum was thus produced in five cases under his own observation. Considering the phagedænic character of these sores, it may be questioned whether they were not, in some cases at least, really tertiary syphilitic ulcers. There is no sufficient evidence that *mucous* patches or tubercles ever give rise to stricture.

Stricture from infiltrating sclerosis is the more frequent form of rectal stenosis. The seat of the stricture is always within reach of the finger, being usually just above the internal sphincter; and, where the anus is not involved, is to be felt from an inch to two inches above the orifice. The form of the stricture is always cylindrical, and extends up the rectal walls for two or at most three inches, where it ends in a defined border usually somewhat festooned or scallopped. The degree of contraction varies; the little finger will sometimes pass through it, though it may not admit anything larger than a No. 12 urethral bougie. Above the stricture the bowel is not simply dilated, but its mucous tissue is eroded or ulcerated. The ulceration involves a considerable surface, and may extend for some distance into the sigmoid flexure, as in a case described by Paget,[2] where indeed tertiary scattered ulceration

[1] Erskine Mason: Amer. Journ. of the Medical Sciences. 1873, January, p. 22.
[2] Paget: Medical Times and Gazette. March, 1865.

of the great intestine appears to have been present as well as stricture. In some cases the muscular layers of the dilated gut are hypertrophied from excessive exercise of their expulsive action. If the infiltrating sclerosis be treated before contraction begins it is amenable to antisyphilitic remedies, and it has been known to become absorbed, but this result is extremely rare. Fournier has seen only two cases where this took place, while in those of Zeissl and Zappulla, who describe the cure of rectal gummata, the evidence that the infiltrating form had been produced is imperfect. When contraction has already begun, the fibrous tissue is quite uninfluenced by medicine, and can only be palliated by surgical treatment.

The great majority of cases of syphilitic stricture are found in women between thirty and forty-five years of age. It has not yet been described as occurring in children. Of seventy cases collected by Allingham[1] ten only were in males. Fournier[2] also gives the proportion of eight females to one male; but no satisfactory explanation of this much greater frequency of the disease in women has yet been given. From five to ten years after infection appears to be the most usual time of its appearance. It may, however, occur earlier. Fournier mentions having seen a case of Verneuil's where a woman had a bad rectal stricture, although she was still the subject of a papulo-squamous syphilide. On the other hand, in many patients the first symptoms are not noted until fifteen or even twenty years after infection.

Symptoms.—The first symptom is usually some degree of constipation with difficulty in defecation, but the signs at first are very slight, and it thus happens that the malady is nearly always overlooked during its early stages. As constipation becomes habitual, languor, discomfort, flatulence, loss of appetite, and other symptoms of disordered digestion appear. After a period of habitually difficult defecation, diarrhœa may be present or may alternate with constipation. The fæces are expelled in smaller and more slender masses as the contraction advances. When ulceration is present the pain during and after defecation may be very severe, though it is not always so; and there is a discharge of pus and sometimes of blood from the bowel. The symptoms are thus similar to those occurring in other forms of rectal obstruction, difficulty in passing motions, alteration in form of the fæces, and accumulation of fæcal matter above the stricture. When the ulceration and thickening attack the anus, the action of the sphincter is interfered with, and thus fæcal incontinence with all its miseries ensues. The

[1] Allingham: Fistula and other diseases of the Rectum. 3rd ed. 1879, p. 230.
[2] Fournier: Loc. cit.

patient then loses appetite and wastes rapidly, death occurring from exhaustion or from perforation of the bowel and consequent peritonitis, or from pneumonia or some other intercurrent disease. If the finger is passed into the bowel, the hard unyielding stricture is at once perceived. After removal from the body, the lower end of the gut appears to be a solid tube of fibrous tissue in which the several constituents of the intestine have become fused inextricably. The mucous membrane is rarely ulcerated, though ulceration be extensive above and below the stricture.

Diagnosis.—In the diagnosis of syphilitic stricture several points have to be taken into consideration. The history of the case is very important, and the patient should always be carefully examined for signs of syphilitic disease elsewhere, though it not infrequently happens in these cases that the rectal affection is the only manifestation which can be discovered. The characters of the stricture itself are peculiar :—It should be remembered that syphilitic disease always begins low down. Fournier, and also Godebert[1] (who has written an exhaustive thesis on this affection, based on Fournier's clinical teaching and elaborated by his own researches), affirm that there is no recorded example of syphilitic stricture beginning more than three inches above the anus. This character is useful in the diagnosis from cancer or dysenteric stricture. The hyperplasic form also affects the whole circumference of the bowel in a uniform manner. It is smooth on the surface, not bossy nor lumpy, nor irregular as is the malignant form of rectal disease. When the little pinkish elevations around the anus are present, they are pathognomonic of the syphilitic nature of the affection.

Before quitting the question of diagnosis it is necessary to touch upon a point in the pathology of this fibrous stricture which is still disputed, namely, whether this affection is properly syphilitic. Various opinions still exist, but as researches more correctly trace the history of this form of stricture, they are gradually yielding to the view that it is directly a consequence of constitutional syphilis. There are nevertheless still those, for example, Lancereaux,[2] Erskine Mason,[3] and Després,[4] who attribute this form of stricture to long-continued inflammatory irritation caused by local sores. This view was elaborated and maintained by Gosselin,[5] though he acknowledges that it is frequently met with in persons who have had con-

[1] Godebert : Essai sur les Rétrécissements syphilitiques du Rectum. Paris, 1874.
[2] Lancereaux : Loc. cit., p. 252.
[3] Erskine Mason : Amer. Journ. Medic. Science. 1873, p. 22.
[4] Després : Gazette des Hôpitaux. 1873, p. 196.
[5] Gosselin : Archives Générales de Médecine. Dec., 1854 ; and Gazette des Hôpitaux. 1879, Aug. 21.

stitutional syphilis. Després, when defending his views in the discussion before the Society of Surgery at Paris,[1] narrated a series of cases to show that this form of stricture developed in patients who had suffered only from local chancres. But the meagreness of detail with which he related his cases rendered them quite untrustworthy evidence that local chancre can cause this form of stricture. The rarity of anal chancre, the extreme rarity of rectal chancre, the difficulty of supposing, in the absence of clinical facts, that the local venereal sore is ever situated so high in the rectum as the usual position of these strictures, render Després' explanation unacceptable. At this discussion the opinions of Panas, Guérin, Verneuil and other French surgeons of note were elicited. They all attributed the affection to development of a hyperplasic deposit, as has been described in these pages. Trelat[2] also has brought forward strong evidence of its syphilitic nature. Before attributing this form of stricture solely to syphilis, the fact has still to be explained that in a large number of the patients, no trace or history of previous syphilitic or even previous venereal disease is obtainable. In thirty out of seventy of Allingham's cases of ulceration and stricture no trace of syphilis was discovered; and in fifteen of Erskine Mason's forty cases, history of syphilis was likewise in default. But on the other hand, the strictures of the rectum which are caused by cancer, by dysentery or by injury—the only other accepted causes of stricture—differ so widely in their history and symptoms that they are readily distinguished from this form of fibrous contraction. Consequently, in the present state of our knowledge, while we can maintain on incontestable evidence that this form of stricture occurs in persons who have suffered, or are suffering, from general constitutional syphilis, and closely resembles in its development, forms of disease undoubtedly set in action in other organs by syphilis, we must also confess that it occurs in persons in whom no trace of previous syphilitic or even venereal disease can be found. There is another circumstance connected with this stricture that apparently is adverse to its specific origin, namely, that it is quite uncontrolled by anti-syphilitic remedies. An explanation of this diversity from the behaviour of most syphilitic affections is however at hand; namely, that when the stricture comes under the observation of the surgeon, it has developed beyond the stage when it is susceptible of the influence of anti-syphilitic remedies; whilst, as already mentioned, in its early stage it has been known to disappear under treatment. The similar sclerotic infiltration which affects the dorsal surface of the tongue, which contracts the fauces and palate,

[1] Reported in the Gazette des Hôpitaux. February, March, and April, 1873.
[2] Trelat: Le Progrès Médical. 1878, Juin 22.

or causes puckering of the liver is also, except in the earliest stage, quite unaffected by mercury or iodine. Consequently this objection, at first sight formidable, is not of much weight.

The Liver.—*Functional derangements* are occasionally observed at the time of the outbreak or during the course of the first exanthem—more properly speaking during the first six months after infection. No satisfactory explanation has been given of the cause of these disturbances. Jaundice is one of the consequences of this derangement. It is transitory and not accompanied by any special lesion; though Murchison[1] has ascribed it to catarrh of the bile ducts. There is moderately yellow staining of the skin; the urine is tawny and the stools are light-coloured; malaise, debility, loss of appetite, nausea, and vomiting may accompany it. The liver is very rarely enlarged; though sometimes it is so, and may be even tender on pressure. The jaundice usually lasts a fortnight, rarely, four or six weeks, and spontaneously departs. Lancereaux has seen jaundice in early syphilis several times, and has collected twenty cases from his own experience and that of others.[2] In none did the disorder last more than thirty days, and in all it terminated favourably.

Pathological changes.—Gubler,[3] Dittrich,[4] Virchow,[5] Wilks,[6] and others were among the earliest of those who traced the true nature of the affections of the liver met with in syphilitic persons. Since their discoveries, others have carried on the investigation, and have aided in defining our knowledge of syphilis of the liver more completely.

The liver is, like other organs, the seat of the two characteristic morbid processes of syphilis—the infiltrating sclerosing hyperplasia, and the circumscribed gumma. But besides these special changes others, not peculiar to syphilis, are found in syphilitic livers; namely, perihepatitis, lardaceous disease, fatty degeneration, local hepatic hypertrophy, and acute yellow atrophy; the first two being common, and the last two very rare occurrences. Both the special forms are seen in adults with acquired disease, and in infants who have inherited their malady; the interstitial sclerosis is more frequent than gumma, though the latter, being most striking, has been most frequently recorded. In inherited syphilis, according to Gubler, gummy nodules are rare: nevertheless, Lancereaux,[7] Wedl,[8] Zeissl,[9] and others mention instances of gummata of the liver in young children.

[1] Murchison: Diseases of the Liver. 1877, p. 153.
[2] Lancereaux: Loc. cit., p. 149.
[3] Gubler: Mémoires de la Société de Biologie, tome iv.
[4] Dittrich: Präger Vierteljahresschrift. 1849—50.
[5] Virchow: Ueber der Natur der Constitut. Syphilis. 1859.
[6] Wilks: Guy's Hospital Reports. 1863; and Pathological Transactions, *passim*.
[7] Lancereaux: Loc. cit., p. 423.
[8] Wedl: Path. Histologie, S. 519.
[9] Zeissl: Lehrbuch der Syphilis. 1872, p. 316.

In Lancereaux's case the child was only a few days old. Coupland[1] also found a gumma four inches by two and a half in the liver of a child three months old.

The interstitial infiltrating hepatitis originates in an increase of the cellular-tissue elements of the capsule of Glisson along the branches or radii of the portal vein and the intercellular connective tissue. The liver is not usually affected throughout, but only in parts. This limitation and isolation of the morbid change is characteristic of syphilitic disease of the liver, especially in adults: in infants, the proliferation of new tissue is much more widely spread. At first, this process enlarges the bulk of the organ, but when fully developed, the new fibrous tissue shrinks, and while contracting, draws in and puckers the liver's surface, taking sometimes for a starting point some of the thickened patches of the peritoneal adhesions. Besides contraction and cirrhosis, this fibrous tissue undergoes partial fatty degeneration, and in it, gummy tumours are often developed—the gummy hepatitis to be presently described. A liver of an adult that has undergone this cirrhosis has the following aspect: it is much firmer than natural; the surface is uneven, being drawn and puckered into large lobes or bosses by the fibrous bands pervading it; the colour is often dirty red with greyish bands. The puckers or seams between the bosses are grey and hard. Section shows that seams and lines ramify through a great part of the organ from these contracted masses of fibrous tissue. The hepatic tissue is pale, yellowish, atrophied; here and there the position of occluded bile ducts is marked by tawny spots of inspissated bile. The loss of bulk in a syphilitic liver varies much; when the cirrhosis is widely extended through the liver, the organ is usually much contracted; Frerichs[2] mentions one no larger than twice the size of a man's fist. But when amyloid degeneration is present, the liver is often enlarged beyond the natural size, or one lobe may be shrunken and another enlarged according to the way it has been affected.

The hyperplasia is more widely diffused in the liver of newly-born or fœtal children. This circumstance, and the opportunity of examining the process at an earlier stage than is usual in the livers of adults, gives a somewhat different appearance to the organ from that just described, by reason of the contraction having made but small advance. The process in infants was first described by Gubler,[3] and Parrot[4] has recently repeated the description in more detail. A liver

[1] Coupland: Path. Trans. 1876, p. 303.
[2] Frerichs: Diseases of the Liver. Sydenham Society's Translation. 1861, vol. ii., p. 154.
[3] Gubler: Gazette Médicale de Paris. 1852, p. 262.
[4] Parrot: Progrès Médical. 1879, p. 577.

so affected is larger and paler than natural, and the edges, especially the anterior one, are rounder than in health. But most characteristic are the hardness and bloodlessness of the organ. This hardness is elastic; so that pieces spring or slip from between the fingers like pieces of india-rubber. The colour varies from pinkish-white to yellow, with a translucency resembling that of flint. This colour is rarely uniform, being generally more or less mottled or marbled with darker or lighter streaks. When looking at the surface, groups of little opaque white or yellowish-white masses resembling grains of sago can be seen through the capsule; the largest grains being towards the centre of the group. The size of the grains seldom exceeds one twenty-fifth of an inch, nor do they project on the cut surface of the liver, with the parenchyma of which they are closely connected. The parts of the liver most particularly thus affected, are the neighbourhood of the suspensory ligament, the margins, and the Spigelian lobe. A zone of injection usually surrounds the groups of grains. This arrangement, when a group has become a large one, gives it sometimes the appearance of a circumscribed tumour. But the groups, nevertheless, are never encapsuled or separated from the liver tissue, into which they fade insensibly. They are intimately connected with the vessels, and large vascular trunks may be surrounded by yellowish areas in which the white opaque grains are most abundant. The gall bladder is shrunken and often hidden in its furrow, while patches of fibrous inflammation of the surface of the liver produce puckering or quilting, with adhesions to the diaphragm or walls of the belly.

A section prepared with carmine, shows under the microscope with a low magnifying power, (a) a yellowish network, the meshes of which enclose clear spaces; (b) irregularly distributed rosy spots; (c) small clearly defined red points, some of which are placed on the network, while others are scattered irregularly throughout the open spaces. Under a higher power, the network is seen to be formed of hepatic cells which are granular and free from fat. The nuclei of these cells form the red points of the network. The clear spaces correspond to the capillaries, and the fibrillary stroma of a lobule. The rosy spots are formed of highly coloured nuclei placed in large numbers round an arteriole or commencing bile-duct. Granular protoplasm occupies the centres of these red spots while other granular material is attracted to the neighbourhood of the vessels. This granular matter is the beginning of the opaque spots seen in a more advanced state by the naked eye. The stages succeeding this consist in fatty degeneration of the hepatic cells, and the elaboration through fusiform and bipolar cells of contractile fibrous tissue. In addition, the walls of the portal veins and smaller

branches of the bile ducts become much thickened. This thickening is composed of two layers, disposed very similarly to the thickening of the coats of the arteries elsewhere; the inner coat becomes vastly increased by new layers of cells which gradually encroach on the lumen of the tube even to entirely blocking it up; the other consists of a multiplication of the connective tissue element of the outer coats and an increase of the capsule of Glisson.

The minute structure of these morbid changes is best traced in the livers of young children, though it is essentially the same as that causing the induration and cirrhosis of adults, namely, an infiltrating hyperplasia intimately connected with and starting from the blood-vessels[1] and delicate prolongations of Glisson's capsule; thus producing in time circumscribed masses of new cells which may form gummata in some parts, and in others the contractile fibrous tissue, which produces adhesions, contractions, and wasting of the normal glandular structure by impeding or arresting its nutrition.

Gummy hepatitis.—When this is present, it is accompanied by the interstitial form though the latter may be developed only to an insignificant amount, and therefore produce but little or no puckering of the liver. Nodules of a roundish or irregular shape form along the course and in the substance of the fibrous seams. The precise beginning and earliest mode of growth of these swellings can readily be comprehended from the preceding description of the minute structure of the infiltrating form in the infantile liver, where large degenerating gummata are rare. The size of these nodules varies from that of a pin's head to that of a cherry. But they may be much larger. Wilks[2] records a case where the cavity of a softened gumma would have received a cricket ball. It was filled with bright yellow fluid in which brown flocculent masses floated. The masses are yellow, sometimes milky white, usually firm, though occasionally diffluent as in Wilks' case, and in one of Moxon's,[3] where the contents had escaped through a bile duct. But they are usually firm enough to be easily dug out of the tissue in which they have grown. The connective tissue in which they are imbedded is found to be continuous with them, and differs chiefly in the closeness of the fibres and the absence of cells. In the gummy masses the meshwork of the fibres is wider, and in their centre the fibres disappear: traversing the masses are new blood-vessels developed for their supply. The loose stroma is packed with cells, well formed, distinctly nucleated, and multiplying by

[1] Lancereaux: Gazette Médicale de Paris. 1873, Nos. 27 and 29.
[2] Wilks: Path. Trans. 1878, p. 135.
[3] Moxon: Path. Trans. 1872, p. 153.

division. At the centre, proliferation of the cells has ceased; there they are shrunken, granular, and pervaded with oil globules. These changes it will be seen, are precisely those met with in gummy disease elsewhere. The further progress of these changes varies in different cases. Sometimes, instead of remaining firm, the gummata become pulpy, and may even soften into a puriform matter. Rarely they calcify, and then the calcareous masses are, according to Lancereaux, embedded in a fibrous envelope. Certainly, also, they are frequently absorbed, leaving furrows or pits of the surface.

Diagnosis.—The contraction of the liver excited by syphilis, is distinguished from non-syphilitic contraction by the following characters. The cirrhosis produced by drunkenness, though uneven, is finely nodulated, whence the name, hob-nail liver. The capsule, though often much thickened, is seldom adherent; in syphilis the viscus is drawn into uneven masses by strong bands, and peritoneal adhesions are generally present. The induration of the nutmeg liver accompanying morbus cordis, is also distinguished by its general evenness from syphilitic cirrhosis.

The gummy nodules differ from tubercles by their larger size, by their being located along the course of the streaks of fibrous tissue, and by the absence of translucent miliary tubercles, or grey granulations around them. In *cancer*, peritoneal adhesions are unusual, the liver is enlarged rather than diminished, and the circumscribed cancerous masses scattered through the liver have no obvious connexion with the fibrous structure.

Peri-hepatitis, or circumscribed inflammation of the capsule and serous coat. A limited area of these tunics inflames and forms adhesions with the neighbouring parts, most commonly with the diaphragm. These adhesions are, at times, so strong and so numerous that it is difficult to extract the liver from the abdomen.

Lardaceous Disease.—Syphilis is one of the most common predisposing causes of lardaceous disease in the liver as well as in other viscera. Goodhart[1] states that the post-mortem inspections of syphilitic subjects made at Guy's Hospital during twenty years showed lardaceous disease in some organ of the body in 43½ per cent. In the liver it is met with very frequently in combination with the other forms of syphilitic disease. The parts so affected are enlarged, smooth, and firm; on section the diseased lobules are pale and translucent. This translucent tissue turns dark brown if touched with solution of iodine. Lobes or groups of lobules are often attacked when surrounded by the infiltrating contractile tissue of the capsule of Glisson. In new-born infants, lardaceous

[1] Goodhart: Path. Trans., Discussion on Lardaceous Disease. 1879, p. 533.

infiltration of the liver is much more frequent than the other forms of syphilitic disease; but it is exceedingly common in adults also.

Acute Atrophy is an occasional complication of syphilis; but how far directly dependent on the influence of the syphilitic virus is still undetermined. Murchison[1] thinks it likely to follow acute catarrh of the bile ducts, which syphilis sometimes excites. Out of one hundred cases of acute atrophy from all causes, collected by Wickham Legg,[2] eight occurred in syphilitic subjects. Andrew[3] relates the case of a man, aged twenty, who contracted syphilis about five months before his death. For five or six weeks before his admission into St. Bartholomew's Hospital, he had been observed to be very drowsy after meals, and irritable when roused. He subsequently became jaundiced and delirious at night. Coma followed, and he died three days after admission. The liver weighed thirty-one ounces. The surface was congested, ecchymosed, and, where not discoloured by contact with the intestines, of an orange-red colour. The colour was somewhat brighter on section than on the surface, with patches of a deeper hue. Under the microscope but few normal hepatic cells were detected. The bulk of the liver was made up of granular matter and oil globules, generally of small size. A few masses of leucine and numerous crystals of tyrosine were also observed. A case reported by Fagge[4] is also apparently of this kind. A woman, aged twenty-three, suffering from a general syphilitic eruption of six months' duration, was attacked in Guy's Hospital by jaundice, sickness, &c., of which she died. Post mortem the liver was opaque, bright yellow, dense, and weighed forty-six ounces. Dr. Goodridge[5] of Bath observed a fatal case of acute yellow atrophy, within the first three months after infection. The patient, a male, was twenty years old, and was affected with syphilitic roseola at the time the jaundice appeared. The liver in this case weighed thirty and a quarter ounces, and the microscopical appearances were similar to those noted by Andrew. In another case, that of a drummer, aged twenty, recorded by Dr. F. Robinson,[6] of the Scots Guards, the patient had a venereal sore, and had been several times under treatment for venereal affections, but there were no clear signs of constitutional syphilis. Wilks[7] also mentions having seen acute atrophy in early syphilis.

[1] Murchison: Loc. cit., p. 153.
[2] Wickham Legg: On the Bile, Jaundice, and Bilious Diseases. 1880, p. 432.
[3] Andrew: Pathological Transactions. 1866, p. 158.
[4] Fagge: Pathological Transactions. 1867, p. 136.
[5] Goodridge: British Medical Journal. 1871, vol. i., p. 609.
[6] Robinson: Pathological Transactions. 1865, p. 152.
[7] Wilks: Pathological Transactions. 1876, p. 375.

The Symptoms of Hepatic Disease are mainly those of functional derangement of the organ with alteration of its bulk. Temporary enlargement of the liver is an occasional occurrence. Hutchinson [1] has narrated a case which he had under observation for many years, where the liver was much enlarged on more than one occasion; but at the necropsy years afterwards the liver was found to be normal. In this instance syphilis was inherited. Two cases have come under our notice where temporary increase of the liver dulness was present during the first general eruption; in one instance, four, and in the other five months after infection, without apparently altering the function of the liver, beyond causing languor and loss of appetite. The change appeared to be simple enlargement, without tenderness or irregularity of the surface. The increase of size departed in between two and three months' time after it was first observed. Hutchinson supposes, for lack of evidence of other change, that the liver is simply engorged for a time. Barlow [2] suggests that engorgement is probably a preliminary stage of the fibrous thickening, and that it may be capable of complete resolution, or may leave some permanent fibrous contractions or adhesions in its wake.

In a case of tertiary disease, in Oppolzer's Clinic, described by Pleischl and Klob,[3] the liver was for a short time larger than natural, but while the patient was under observation it diminished until he died. The inequalities of the surface are sometimes sufficiently distinct to be detected during life, causing the affection to be looked upon as cancerous. Pain and tenderness are seldom present. Jaundice is rare, and commonly transitory when it occurs. Two of Pleischl and Klob's cases had jaundice before death. Frerichs,[4] Gubler,[5] and Lancereaux [6] record others. Fagge [7] mentions two instances; in one of which, that already cited, the patient died of acute yellow atrophy; in the other, he regained his health.

In the following case, the enlargement was reduced by treatment without affording any signs of contraction; the functions of the liver being regained as the enlargement subsided. The patient had been infected six years before he consulted me. During that time he had had rupia, sore throat, nodes of the shins and sternum. During the eighteen months before he consulted me for the condition of his liver, he had suffered from copious night sweats, the evening temperature ranging between 100° and 102° F., accompanied by great weak-

[1] Hutchinson: Path. Trans. 1877, p. 309.
[2] Barlow: Path. Trans. 1877, p. 355.
[3] Pleischl and Klob: Wiener Med. Wochenschrift. 1860, S. 113.
[4] Frerichs: Diseases of the Liver. Syd. Soc. 1861, vol. ii., p. 156.
[5] Gubler: Mémoires de la Soc. de Biologie. 1853, tome v.
[6] Lancereaux: Loc. cit., p. 360.
[7] Fagge: Loc. cit., p. 138.

ness, nausea, occasional diarrhœa, alternating with constipation and clayey stools. No jaundice was noticed during this period, but he had lost twenty-six pounds in weight. He had constant pain in both loins by day and night, but most acute on the right side. The urine was very acid, and loaded with urates. The liver dulness reached downwards four finger-breadths below the ribs. There was tenderness on pressure over the left rectus muscle near the ensiform cartilage, also in the right lumbar region. There was no tenderness or swelling of the subcutaneous bones. After two months' treatment by mercurial inunction, the liver's dulness reached barely two finger-breadths below the right ribs. There was clear note on percussion on the left side of the left rectus, and in the epigastrium. The temperature had become normal, the sweats had disappeared, and his weight was increasing.—B. H.

A similar case of enlargement of the liver which developed five years after infection and disappeared under treatment has been recorded by Rodet;[1] and several most instructive cases, in some of which the frequent mistake was made of attributing the hepatic enlargement to any cause rather than to syphilis, are narrated by Murchison.[2]

Ascites is occasionally present in syphilitic disease of the liver; its course and termination need not be dwelt on here. Wunderlich has noted rise of temperature in the early stages of the disease. Epistaxis, hæmorrhoidal flux, disordered digestion, anasarca, wasting and cachexia, are all occasional consequences of cirrhosis.[3]

Like other syphilitic affections, those of the liver are rarely the only effects of the poison in action; there commonly are also ulcers of the palate, caries of the bones of the skull, ulcers of the skin, &c. The course of syphilitic disease in the liver is obscure, always slow, ending sometimes in death; but if recognised and appropriately treated, recovery may take place.

The Spleen.—This organ is frequently enlarged temporarily during the exanthematous stage of syphilis. In infants Gee[4] found this alteration in four out of thirteen cases of inherited syphilis. According to this observer, if the spleen be very greatly enlarged, the infant usually dies. Birch-Hirschfeld[5] found the spleen to have gained double its normal volume in certain fatal cases of inherited syphilis. Barlow[6] has noted the spleen to be more or less enlarged in twenty-two out of twenty-eight children with inherited syphilis. According to Eisenschitz,[7] enlargement of

[1] Rodet: Ann. de Derm. et de Syph. 1870, vol. ii., p. 81.
[2] Murchison: Loc. cit., pp. 147, *et seq.*
[3] Duckworth: St. Barth. Hosp. Reports, vol. x., p. 61.
[4] Gee: British Medical Journal. 1876, Ap. 13.
[5] Birch-Hirschfeld: Arch. der Heilkunde. 1875, 2ter Heft.
[6] Barlow: Path. Trans. 1877, p. 354. See also Weil: Deutches Archiv für Klin. Med. 1874, 13 Bd., 3ter Heft; and Vierteljahr. für Derm. u. Syph. 1874, S. 600. Beer: Eingeweide Syph., Tübingen. 1867. Schuster: Archiv für Dermatologie u. Syph. 1873, s. 283.
[7] Eisenschitz: Wiener Med. Wochenschrift. 1873, Nos. 48 and 49.

the spleen is almost invariable even before the appearance of any eruption on the skin. Tepel,[1] who noted the proportionate weight of the spleens of syphilitic newly-born infants, found them to be increased to three or four times their normal weight. Barlow, observing the disease in children, has remarked that the spleen enlarges rapidly during the early outbreak of the general symptoms, and that it may remain enlarged long after other symptoms of the diathesis have disappeared.

In adults, enlargement of the spleen occurs in the early as well as in the later periods, though less frequently than in children. Wewer[2] noted a large spleen in three out of seventy-nine soldiers suffering from early syphilis. The enlargement was remarked between the fifty-fifth and eighty-fifth days after infection, and about the fifth day after the appearance of the first general syphilide on the skin. The swelling lasted from one month to two months. The nature of the changes which syphilis may produce in the spleen are various. Probably the temporary swelling in the early stages is caused by hyperæmia, giving rise to induration and permanent hypertrophy in a few cases. This hypertrophy may be considerable. In eight of Wilks and Moxon's cases[3] it averaged nineteen ounces.

In a patient who had been twice infected by syphilis, the spleen became greatly enlarged during the first year of his second infection. It was easily felt through the abdominal walls extending beyond and below the umbilicus. The tumour was never tender nor painful; though a sense of weight and distension and shortness of breath caused some distress. In rather more than a year after its discovery, the enlargement slowly subsided altogether. The patient died twelve years later with syphilitic hepatic disease.—B. H.

When specific changes in the spleen are noticed they are generally present with hepatic disease.[4] The changes in structure may be of two kinds. (1) Interstitial hyperplasia, causing induration, and fibrous contraction of the trabecular tissue where it takes place. Post mortem, the spleen is found to be at certain parts firmer and tougher than natural. Its capsule is marked with masses of fibrous tissue that penetrate for some distance into the substance of the organ. (2) Circumscribed gumma of the spleen is a rare affection, but a sufficiently large number of cases have been recorded to place the fact of its occasional development beyond doubt,[5] though infarcta

[1] Tepel: Beitrag zur pathol. Anat. der congenit. Syph. 1874.
[2] Wewer: Deutches Archiv für Klin. Med. 1876, Bd. xvii., S. 459.
[3] Wilks and Moxon: Pathol. Anatomy. 1875, p. 475.
[4] Mosler: Ziemssen's Cyclopædia of Medicine, vol. viii., p. 485.
[5] Wilks: Med. Times and Gazette. 1862, Oct. 25, p. 435. Wagner: Das Syphilom. Archiv der Heilkunde. 1863, p. 433. Greenfield: Path. Trans. 1876, 1877, p. 255. Mahomed: *Ibid.*, p. 339. Barlow: *Ibid.*, p. 353, and others.

which have become fibrous are often mistaken for true gummata. The genuine nodules may be single or multiple; not yet observed to attain the large size that they reach in other organs, they usually range between a pea and a cherry in bulk. They form tough, yellowish-white masses imbedded in the substance of the organ and are usually intimately connected with the blood-vessels. Most of the examples hitherto recorded are described as having been found at the necropsies of patients who had long suffered from tertiary affections, and who presented gummata of other viscera. Nevertheless, they may be developed early; Sutton and Hutchinson[1] have recorded their discovery in patients who died during the evolution of the general skin eruptions.

Lardaceous disease is not infrequently seen in the spleens of syphilitic persons, to which the albumenoid masses give the characteristic appearance, designated 'sago splèen.'

The Thyroid body, in patients with syphilitic disease of other organs, has been found enlarged and firmer than usual, with here and there masses of yellowish colour scattered through it; such masses appeared to Lancereaux[2] to be parts of the glandular tissue undergoing fatty degeneration. But no distinct gumma in the thyroid body has yet been recorded.

The Pituitary body has been seen by Meyer,[3] Virchow,[4] and Lancereaux[5] to be the seat of hypertrophy and of pasty yellowish grey masses which were taken for gummata.

The Suprarenal Bodies.—Similarly to the thyroid body, the suprarenals are said to be sometimes enlarged.[6] Some authors[7] profess to have remarked conditions more specifically syphilitic; namely, uniform grey infiltration and an almost gristly consistence of the organ. Chvostek, v. Bärensprung, and Huber, describe the swollen body to be beset with small granules or miliary spots arranged across the cortical portion as radiating striæ. Virchow also has described fatty degeneration of these bodies as being frequent in inherited syphilis. In Chvostek's case on the surface of both bodies were many tough contractions; between the furrows thus caused were nodules the size of a barleycorn, hard and yellow, giving the surface a granular aspect. The substance was quite hard, like gristle.

[1] Hutchinson: Path. Trans. 1876, p. 347.
[2] Lancereaux: Loc. cit., p. 288.
[3] Meyer: Schmidt's Jahrbuch. 1862, p. 312.
[4] Virchow: Die Constitut. Syphilis. 1859.
[5] Gros et Lancereaux: Affections Nerveuses Syphilitiques. 1861, p. 124.
[6] Lancereaux: Loc. cit., p. 288.
[7] v. Bärensprung: Loc. cit., S. 191. Virchow: Archiv, Bd. xv., S. 315. Hecker: Monatschrift für Geburtskunde. 1869, S. 23. Huber: Deutsches Archiv für Klin. Med. 1869, Bd. 5, S. 271. Merckel: Ziemssen's Cyclop., viii., p. 666. Chvostek: Wiener Med. Wochenschrift. 1877, Aug., No. 33, S. 794.

Section of the cortical part showed small wedge-shaped yellow masses to be pretty numerous throughout. The medullary portion was firm and of bluish grey colour. The yellow masses, when examined by the microscope, were found to be in a state of fatty degeneration. This patient, who had been infected twenty years before death, had well-marked syphilitic disease of the skin, liver, spleen, and lungs.

The Pancreas.—This gland has been found indurated by hyperplasia of the cellular tissue surrounding the blood-vessels, causing enlargement of the organ, most particularly of the head; the affected parts assuming a glistening white appearance, and the proper gland tissue being atrophied by compression. Gummata scattered through the body of the pancreas are also recorded: this latter form being much less frequent than the former. Both forms attack the pancreas in adults and in infants. Verneuil[1] has reported the occurrence of two gummy nodules in the pancreas of an adult who had also gummata of the testes, skin and muscles. Cruveilhier has described lardaceous infiltration of the whole pancreas. Among infants the pancreas is affected with considerable frequency. Birch-Hirschfeld[2] met with infiltration and induration of the pancreas thirteen times in seventy-three syphilitic fœtuses. Klebs[3] discovered a gumma in the pancreas of a six months' fœtus.

The Salivary Glands.—Very little is known respecting affections of these glands in syphilis. Lancereaux[4] mentions the case of a woman, aged 45, who died in La Pitié Hospital, in whom, in addition to widely spread syphilitic changes in other organs, the left submaxillary gland presented numerous furrows between its lobules. The gland was firmer than natural, and yellow from fatty degeneration, but was not diminished in size; the interacinous septa were thickened. Fournier[5] relates the following case:—A man aged 30, who had been under his care for syphilis eleven years before, again sought advice in October 1873 on account of a hard painless swelling of the sublingual gland; the tumour was four centimetres in length, and one centimetre broad. After three days' treatment by iodide of potassium the swelling began to diminish; in January 1874 it had disappeared, and up to 1876 there had been no return. The patient whilst under treatment had also a syphilitic tubercle of the glans penis, and in 1874 suffered from plantar and palmar

[1] Verneuil: Bulletin de la Soc. Anatom. 1855, p. 98.
[2] Birch-Hirschfeld: Loc. cit.
[3] Klebs: Handbuch der Path. Anat. 1870, S. 559. See also Lancereaux: Loc. cit., p. 255. Hecker: Monatschrift für Geburtskunde. 1869, p. 22; and for a very complete description of the affection, Friedreich, in Ziemssen's Cyclop. of Med., vol. viii., p. 586.
[4] Lancereaux: Loc. cit., p. 253.
[5] Fournier: Annales de Dermatologie et de Syphiligraphie. 1876, tom. vii., p. 81.

psoriasis. Fournier considers the outbreak of these undoubtedly syphilitic affections, together with the rapid subsidence of the sublingual swelling under iodide, to be proof of its syphilitic nature. Verneuil,[1] in some remarks on Fournier's case before the Société de Chirurgie, mentioned a somewhat similar instance which he had himself observed.

[1] Verneuil : Gazette des Hôpitaux. 1875, p. 1159.

SYPHILIS.

CHAPTER VI.

THE RESPIRATORY SYSTEM.

The Nose.—*The Initial Lesion* has been noticed, though very rarely, in the nostril. A case recorded by Nettleship has already been referred to in Chapter III. Another example has been noted by Dr. Cutter[1] of Sappow: a scar was found in the left nostril with enlargement of the submaxillary and posterior auricular glands on the same side, and there was no appearance of initial lesion elsewhere about the body, the genital organs being quite healthy. General syphilis followed.

Erythema.—The lining membrane of the nose is sometimes, like that of the fauces, acutely inflamed while the roseolous eruption of the skin is present. The membrane is at first red, dry, and itching; and troublesome sneezing is often excited. In a few days this condition subsides with a copious secretion of mucus.

The affections of the nose which occur during the papular eruptions are much more common than the preceding. The hair follicles inside the nostrils form *pustules* and *ulcers*, on which the pus and mucus dry into very irritating scabs, which leave a bleeding surface when rubbed off. *Fissures* occur around the margins of the nostrils now and then, and *mucous patches* may form on the internal surface of the alæ nasi or on the septum. The sores and fissures are often exceedingly painful and obstinate, and, if neglected, may excite inflammation of the periosteum or perichondrium of the septum narium, which runs on sometimes to limited destruction of the bone or cartilage.

Necrosis of the bones of the nose is more frequent several years after contagion. The process begins by the deposit of gummy material in the mucous membrane and periosteum. Slow ulceration then occurs at two or three points, and the bone or cartilage in

[1] Cutter: Philadelphia Medical Times. March 13, 1880.

time becomes exposed. Necrosis follows, and the dead portions of bone come away piecemeal after a longer or shorter interval. Perforation of the septum nasi is by no means an infrequent result of syphilis. If the progress of the disease be not checked the whole of the bones of the nose may be destroyed, in which case the bridge and soft parts sink in until a hollow replaces the natural prominence of the part. Besides this, the destructive process may extend downwards along the vomer to the hard palate, or upwards along the ethmoid and spongy bones to the base of the skull. The nose, mouth, and pharynx may in the end form one cavity, which becomes lined by a greyish tough fibrous membrane: in such a case taste and smell are of course obliterated; and the acts of speaking and swallowing are performed only with great difficulty, while the voice acquires a peculiar nasal twang.

When the hard palate is perforated, it is usually by extension of the necrosis from the nasal to the oral cavity. The opening is nearly always in the mesial line, and most frequently near the junction of the soft with the hard palate. The gap thus caused may be so small as not to allow a probe to pass, or it may widen until the whole of the hard palate, except the alveolar border which is seldom included in the destruction, has been cleared away. When the hole is very small, it may become closed by cicatricial tissue, but usually it remains pervious for life.

Syphilitic disease of the nasal bones occurs both in the acquired and the inherited forms of the disease. When a consequence of the inherited form, these affections of the bones of the nose are occasionally seen in infants, but much more commonly in later life, especially at the approach of puberty.

Ozena is the term applied to the peculiarly offensive purulent discharge which escapes from the nares while the changes just described are going on. This discharge persists until the whole of the diseased bone has been removed or has come away, and is the source of great distress both to the patient himself and to those who come near him.

Symptoms.—Itching, soreness, and a more or less blood-stained discharge are the symptoms of the early pustules and erosions of the nostrils. The later syphilitic affections of the naso-pharyngeal cavity are frequently very insidious in their onset, and may constitute the sole manifestation of the disease. The symptoms are often very slight until the bones have become involved. Obstinate nasal catarrh with a sense of stiffness in one or both nostrils, especially if accompanied by abnormal sensibility, or tenderness on pressure, or dull pain about the root of the nose or the forehead, ought always to be regarded with suspicion; and a careful exami-

nation of the parts should be at once instituted, and the patient's history enquired into. When the posterior nares are affected the patient generally complains of dryness of the pharynx with discomfort or pain on swallowing; and on looking into the mouth a layer of tenacious greyish mucus may often be seen adhering to the posterior pharyngeal wall. The voice also will be more or less thick and nasal in character, and a bad smell is often complained of by the patient. Earthy pallor of the complexion is also often present in these cases. When these signs are present the naso-pharyngeal cavity should always be carefully examined with the aid of a mirror; for if energetic treatment, both general and local, be not carried out at an early period, there will be great risk of irremediable destruction of the bony framework of the nose, and perhaps of lifelong deformity.

Diagnosis.—The diagnosis of the early affections of the nose is easy. In the case of catarrh the ordinary signs of a common cold will be wanting. Fissures, mucous patches, and ulcerations can usually be readily seen either by the unaided eye, or with the help of a speculum. Besides, other prominent signs of syphilis will be present.

In later syphilis, purulent chronic discharge may be secreted by ulcers which are out of sight, though the rhinoscope will probably bring them within reach of vision. To distinguish ozena of syphilitic from that of scrofulous origin is difficult, and becomes the more so as one by one the peculiarities formerly allowed to scrofula are claimed as evidence of syphilitic disease. So nearly complete is this abstraction, that little is left for the identification of scrofula but its indifference to anti-syphilitic remedies. Even this characteristic has little value, if we recollect that certain syphilitic scleroses of the submucous tissue of the tongue, fauces, and rectum are unaffected in their later stages by mercury or iodide of potassium. Nevertheless, as the non-existence of a scrofulous ozena is still a matter of dispute, the term scrofulous may be still applied to the slowly progressing inflammation of the nose and upper pharynx, where the mucous membrane is uniformly thickened, its surface granular, and of a purplish red colour. If, as not infrequently happens in the later syphilitic affections of this region, there be no other sign of syphilis to guide us, the history becomes most important, both of the patient himself, and also, in the case of a child, of the parents and other immediate relations.

The Larynx is attacked in inherited and in acquired syphilis by nearly identical affections; though the tertiary forms are more rarely developed in young children than in adults. Barlow,[1] Lees,

[1] Barlow and the others. Discussion at the Pathological Society on cases of syphilitic laryngeal disease in young children. Lancet, 1880, April 10. See also, John Mackenzie on

John Mackenzie (of America) and Sémon, all agree that affections of the larynx are not infrequent in young children.

The larynx is far less commonly the seat of syphilitic disease than the pharynx. Sémon [1] found that of 1100 cases of syphilitic throat disease, 800 involved the pharynx and 300 the larynx. With regard to the frequency of laryngeal affections among syphilitic patients, Engelsted [2] found twenty-five cases among 521 cases of syphilis; Lewin [2] forty-four in 1000 patients; Fournier [3] a similar proportion in the secondary period only. Altenhofer [4] found however only twenty-five laryngeal cases among more than 1200 syphilitic persons; Rühle [5] recorded fifteen instances in 100 post-mortem examinations at Prague.

The later forms of laryngeal syphilis have long been known, the early forms have only been accurately observed since the introduction of the laryngoscope.

Of 118 cases of secondary syphilitic affections of the larynx observed by Mackenzie [6] there was congestion in fifty-one. In seventeen of the fifty-one there was also congestion of the trachea, and in twenty-four there were mucous patches in the pharynx. Mucous patches of the larynx were present in forty-four cases; and there was ulceration in twenty-three. In eighty-one of the 118 cases there was at the same time secondary disease of the pharynx.

The same observer tabulates 189 cases of tertiary laryngeal disease. Among these were forty-eight of superficial ulceration with laryngitis; 107 of deep and extensive ulceration; twenty-seven of contraction; and five of gummata. Acute œdema occurred seven times, and chronic œdema thirty-two times.

Early Forms —According to Gerhardt and Roth,[7] these are met with at the time of the papular eruptions of the skin, and are usually, though not always, associated with similar affections of the fauces and tonsils. They may be divided into three varieties—*Erythema*, *superficial ulcers*, and *mucous patches*, which sometimes become prominent tubercles.

Erythema.—This, according to Virchow [8] and others, the most usual early affection of the larynx, was met with by Roth only twice

Congenital Syphilis of the Throat, based upon the study of 150 cases. Amer. Jour. of Med. Sci. October, 1880.

[1] Sémon : Lancet. 1880, vol. i., p. 605.

[2] v. Ziemssen quotes Engelsted and Lewin in his Cyclopædia, vol. vii., p. 861.

[3] Fournier : Syph. chez la Femme, p. 577.

[4] Rühle quotes Altenhofer from the Russische Sammlung für Naturwissenschafte und Heilkunde. 1ster Bd., 1ster heft.

[5] Rühle : Kehlkopf-Krankheiten. Berlin, 1861, p. 275.

[6] Morell Mackenzie : Diseases of the Throat and Nose. 1880, vol. i., p. 354.

[7] Gerhardt and Roth : Virchow's Archiv, Bd. xxi., S. 10. 1861. Tobold : Laryngoscopie, &c., 3ter Aufg. 1874; and Whistler : Syphilis of the Larynx, 1879, may also be consulted.

[8] Virchow : Ueber der Natur der Constitutionellen Syphilis. 1859.

in eleven cases of laryngeal affection in patients with papular eruption. It consists of rosy reddening of the mucous membrane, with increased secretion. The congestion is generally confined to a part only of the surface, while the rest retains its ordinary aspect. *Superficial erosions*, or small ulcers of the mucous membrane are frequent accompaniments of erythema. They form on the surface of the epiglottis and neighbouring parts, either singly or several at once, particularly on the fold between the epiglottis and the tongue. Partial œdema of the mucous membrane of the larynx sometimes accompanies this catarrh and, according to Krishaber,[1] may even endanger life. The symptoms of this affection are hoarseness, sense of dryness, and now and then a little pain in the throat. The catarrh usually subsides in a few weeks. If, however, a relapse take place, the affection may become very obstinate.

Mucous patches were present in nine of the cases collected by Gerhardt, and in ten of fourteen cases of syphilitic laryngitis noted by Krishaber and Mauriac. They occur most frequently on the epiglottis and inter-arytænoid commissure (Mackenzie[2]), but also on the arytæno-epiglottidean folds, the posterior wall of the larynx, the false vocal cords, the arytænoid cartilages, &c. (Türck[3]). On the true vocal cords they are, according to Stoerk,[4] very rare.

Of sixty syphilitic patients examined by me at the Lock Hospital mucous patches of the larynx were present in five. Four times the epiglottis was the part affected, and once the inter-arytænoid commissure.—A. C.

According to Mackenzie[5] mucous patches in the larynx generally appear as smooth yellow projections, sometimes round but more often oval, varying in diameter from three to seven millimetres, but in rare cases attaining the breadth of a centimetre. They are seldom so white as in the pharynx, and the surrounding mucous membrane is not generally so much congested. They are usually associated with similar lesions in other situations; thus in twenty-four cases observed by Whistler,[6] mucous patches of the mouth, pharynx or genital organs were present at the same time. They may disappear without ulcerating and without any treatment. Sometimes, however, they ulcerate and then present much the same appearance as ulcerated mucous patches in other situations. Hoarseness, varying in degree in different cases, is generally the only inconvenience caused by mucous patches. Pain, cough, and expectoration are mostly absent.

[1] Krishaber: Annales des Maladies de l'Oreille et du Larynx. 1875 and 1878.
[2] Morell Mackenzie; Loc. cit., p. 356.
[3] Türck: Article on the Larynx in Zeissl's Lehrbuch der Syphilis. 1872, p. 206.
[4] Stoerk: Klinik der Krankheiten des Kehlkopfs. 1880, p. 340.
[5] Morell Mackenzie, Loc. cit. p. 356.
[6] Whistler: Syphilis of the Larynx. 1879.

The later affections of the Larynx.—In this region, as in many others, the late affections are nearly included in the two forms of hyperplasic infiltration and circumscribed gumma. They are rare before five years have passed since the primary sore.

The hyperplasic infiltration begins by slow thickening of the submucous tissue which becomes hard, pale, and uneven at points. The induration does not extend over the whole larynx at first, but begins in patches, and spreads irregularly over the surface. Slight accidental irritation kindles ulceration in these indurated parts, which extends slowly from place to place, destroying the mucous membrane and penetrating the submucous tissue, forming deep ulcers, irregular in outline, and covered with a viscid secretion.[1] The mucous membrane around the ulcers is red and slightly swollen; and when they heal, they leave tough contracting scars, which may cause great distortion of the larynx.

The most frequent seat of these ulcers is the posterior surface of the epiglottis, beginning especially at the tip (Tobold). They may perforate or totally destroy it.[2] From the epiglottis, the ulceration spreads to the arytæno-epiglottidean folds, or to the arytænoid cartilages; the latter are also the seat of independent ulceration, by which they and the cartilages of Santorini are sometimes destroyed. The ulcers extend frequently into the trachea, or upwards to the root of the tongue and the pharynx, sometimes causing adhesion of the remains of the epiglottis to the fauces. The true vocal cords, according to Türck, are occasionally beset with ulcers, independent of extension from above. When the disease is of long standing, the lymphatic cervical glands often enlarge. Parrot[3] has seen an ulcer of the anterior surface of the epiglottis in a child two months old, and in another child an ulcer of the anterior wall of the larynx between the vocal cords.

Gumma.—Besides chronic induration of the mucous membrane, terminating in ulceration and necrosis of the cartilage, another change occurs, namely, the formation of gummy nodules in the submucous tissue. They give rise to projections in different parts of the larynx, springing commonly, according to Türck, from the front of the hinder wall of the larynx; they generally soften and ulcerate, but may be absorbed under treatment. Türck says they may be converted into dense fibroid nodules, which are permanent. But this change is very rare. Though usually ulcerating early, they

[1] For instances, see Pleischl and Klob: Weiner Med. Wochenschrift. 1860, Nos. 8, 9, 10; and Wilks: Path. Trans., vol. ix., pp. 52, 272; Van Buren: New York Medical Times, No. 2. 1860; Liston: Path. Trans., vol. i., p. 47; Czermak: Practical use of the Laryngoscope, Syd. Soc. Trans. 1861, pp. 66, *et seq.*; Whipham: Path. Trans. 1870, p. 219, &c.

[2] Lancereaux, loc. cit., p. 314.

[3] Parrot: Progrès Médical. 1878, p. 653.

may reach a large size before breaking down. Norton[1] exhibited before the Pathological Society a gumma larger than a pigeon's egg occupying the right arytæno-epiglottidean fold, and extending into the pharynx. The patient had died before the trachea could be opened.

Vegetations.—Krishaber and others allocate among syphilitic affections the *vegetations or papillomata*, which are not infrequently developed during the circatrising stage of deep ulcers. The outgrowths may attain such a size as to become a hindrance to respiration and phonation,[2] or may even cover the whole entrance to the larynx.[3]

Perichondritis and Necrosis.—Perichondritis is a not infrequent consequence of the extension of ulceration produced by the breaking down of the diffused hyperplasic deposit or of gummata. If the inflammatory process be not very early arrested, necrosis follows and the dead portion of cartilage separates. Fatal cases of impaction of detached portions of cartilage in the upper part of the larynx are recorded by Durham[4] and Dowse.[5]

Anchylosis of the Crico-arytænoid Articulations occasionally occurs as a consequence of syphilitic disease. The affection is a rare one; but of eighteen cases collected by Sémon,[6] including one observed by himself, in six the primary cause was stated to have been syphilis. Mackenzie[7] remarks that the diagnosis is attended with difficulty, and that paralysis of the adductors or abductors may simulate anchylosis, which, however, may be inferred to exist when immobility of one or both vocal cords is accompanied by marked irregularity in the form of the cartilages, or of the upper part of the cricoid cartilage. In a remarkable case observed by Sidlo,[8] which was diagnosed during life as one of paralysis of the posterior crico-arytænoid muscles, the necropsy revealed dislocation and anchylosis of the arytænoid cartilages, which had followed syphilitic ulceration.

Contraction or Stenosis of the larynx as a consequence of syphilitic ulceration may be partial or complete. When complete, the voice is lost, and respiration has to be carried on through an artificial opening. When less complete, it may allow the patient to breathe sufficiently to live if he be kept quiet; but he is in daily risk of suffocation from slight swelling. When the stenosis is due to cicatricial contraction following deep ulceration, great deformity of

[1] Norton: Path. Trans. 1874, p. 38.
[2] v. Ziemssen: Ziemssen's Cyclopædia, vol. vii., p. 874.
[3] Rühle: Kehlkopf-Krankheiten, S. 273.
[4] Durham: Holmes' System of Surgery, 2nd edition, vol. iv., p. 559.
[5] Dowse: Path. Trans. 1874, p. 26.
[6] Sémon: Med. Times and Gaz. 1880, Oct. 9, p. 429.
[7] Morell Mackenzie: Loc. Cit., p. 476.
[8] Sidlo: Wiener Med. Wochenschrift. 1875.

the parts sometimes results. Mackenzie remarks that such curious and irregular distortions and outgrowths may be produced as to render it occasionally almost impossible to identify the various parts. When stenosis is produced by the formation of a web or membrane between the vocal cords, the occlusion is most perfect anteriorly, the chink, if not quite closed, being left open at its posterior part.[1] Elsberg[2] has recorded six cases of membranous occlusion of the larynx. Sommerbrodt[3] reports a case in which he was able to watch the development of a membranous union between the vocal cords, which completely closed the anterior third of the rima glottidis.

Stenosis very rarely occurs in young children. Sémon[4] submitted to the Pathological Society two specimens of fatal stenosis from hyperplasic thickening of the larynx in inherited syphilis. The patients were brothers, aged respectively $5\frac{3}{4}$ and $3\frac{1}{2}$ years. Both showed other evidence of congenital syphilis. In both children the immediate cause of death was acute œdema of the glottis. Allen Sturge[5] also exhibited before the same society the larynx of a boy $2\frac{1}{2}$ years old, in which the true and false vocal cords had been destroyed by ulceration; cicatrisation had produced symmetrical deep fissures with commencing stenosis of the upper part of the trachea. Death was caused by œdema of the glottis. Fränkel[6] found stricture of the larynx following perichondritis in a child two months old. Parrot[7] also has seen a similar case.

Lefferts[8] has observed six cases of inherited syphilis in which the larynx was affected at a later period of life. In three cases the disease was limited to the epiglottis, which in two was totally destroyed. In the other three there was general destruction of the superior laryngeal tissues with resulting stenosis. In all the cases the pharynx was also affected. The ages of these patients varied between ten and eighteen years.

Laryngeal paralysis.—This may depend on syphilitic lesions developed within the cranium,[9] or affecting the recurrent laryngeal nerves. Lastly, immobility of certain parts may be caused by syphilitic lesions of the muscles or of the cartilages, as has been already described.

Our knowledge of laryngeal paralysis due to syphilis is still very

[1] Morell Mackenzie and Evans: Medical Times and Gazette. 1871, vol. ii., p. 218.
[2] Elsberg: Amer. Journ. of Syphil. and Dermat. 1874, p. 1.
[3] Sommerbrodt: Berlin Klin. Wochenschrift. 1878, April, No. 13.
[4] Sémon: British Medical Journal. Feb. 14, 1880.
[5] Sturge: Lancet. April 10, 1880.
[6] Fränkel: Wiener Med. Wochenschrift. 1868, No. 18.
[7] Parrot: Progrès Médical. 1878, p. 653.
[8] G. M. Lefferts: Quoted by Bumstead and Taylor: Venereal Diseases. 1879, p. 754.
[9] Hughlings Jackson: On Palsy of the Vocal Cord from Intra-Cranial Syphilis. Brit. Med. Journal. 1873, Jan. 25.

imperfect. The following cases are given in detail, as from them may be learned most of what is known on the subject. For further information on laryngeal paralysis the first volume of Morell Mackenzie's treatise on 'Diseases of the Throat and Nose' may be consulted. That work also contains a very complete bibliography of the subject.

Lefferts[1] has described the condition of two patients, with indisputable evidence of previous syphilis, who suffered from paralysis of both the posterior crico-arytænoid muscles. The symptoms were almost wholly removed by specific treatment. In one case, a robust woman of forty had extensive loss of tissue and scars in the pharynx, and perforation of the hard palate. The affection of the larynx came on about five years after her infection. She had very severe paroxysmal dyspnœa during inspiration, expiration being easy and noiseless. The voice was slightly husky and the cough infrequent and without expectoration. Laryngoscopy showed that the rima glottidis gaped slightly during expiration; in ordinary inspiration it was nearly closed and became quite so if forcible attempts to inspire were made. In phonation there was juxta-position of the vocal cords with vibration of the right cord due to adductive movement, the left being quite motionless. The laryngeal mucous membrane was slightly reddened, but showed no old catarrhal process; its sensibility was undiminished. There was no evidence of central disorder or of pressure upon nerve-trunks. The lesion was wholly limited to paralysis of a particular muscle. Though attacks of dyspnœa were occasionally urgent, Lefferts was able by iodide of potassium and mercury to quickly reduce their severity, and in six weeks to restore almost normal movement to the larynx.

The second case was very similar to the first, both in the sudden onset of the dyspnœa, and in the symptoms attending it. The patient, a woman of thirty-five, having borne a series of syphilitic children, besides suffering in her own person, had been infected about fifteen years. The paralysis first showed itself after a violent cold. Improvement under mercury and iodide of potassium was rapid, and control of the vocal cords was speedily regained. This patient was exhibited at the New York Laryngological Society in 1878, when a slight lack of muscular force was alone perceptible; the vocal cords were not immediately abducted when inspiratory efforts were made.

Hansen[2] has described a case, in a woman of thirty-one with well-marked syphilis. The symptoms were similar to those in Lefferts' cases, except that phonation was but slightly affected and there was considerable loss of sensibility, both of the fauces and of the larynx. In this case cure followed quickly on mercurial inunction, and became almost complete.

Poyet[3] narrates the case of a man, aged thirty-four, who, twelve years after infection, suffered from hoarseness and shortness of breath. On examination the left vocal cord was quite straight and immovable, the mucous membrane of the whole larynx being perfectly healthy. The patient had also immobility of the right pupil and loss of sensation in the right cheek. There were no signs of thoracic tumour, nor of any other source of pressure on the laryngeal nerve. Under iodide of potassium great improvement took place and the vocal cord became movable.

[1] **Lefferts**: Clin. Reports of the Demilt Dispensary. New York Medical Journal. 1878, vol. 28, p. 611.

[2] **Hansen**: Petersburger Mediz. Zeitschrift. 1876, No. 6. Abstract in Virchow u. Hirsch's Jahresbericht für 1876, Bd. 2, S. 140.

[3] **Poyet**: Des Paralysies du Larynx. Thèse de Paris. 1877, p. 51.

Simyan[1] also relates a case communicated to him by Libermann: A man, aged thirty-five, contracted syphilis in 1865. In May, 1873, the voice became altered and complete aphonia was gradually produced. In January, 1874, the laryngoscope showed the left vocal cord retracted, and deprived of movement. The right vocal cord was slightly red posteriorly, but retained all its movements perfectly. The margin of the epiglottis was irregular, probably from old ulceration. Nothing wrong was made out in the heart or lungs, and there were no enlarged cervical glands. After twenty subcutaneous injections of red iodide of mercury the voice began to return, and after seventy-five the voice had become normal. The laryngoscope showed that the vocal cords approximated completely except anteriorly where there was a gap about one millimetre wide. Two years afterwards the left cord moved perfectly, and in every way appeared quite healthy.

Symptoms.—In the early syphilitic affections of the larynx, a varying degree of hoarseness is almost the only symptom. Pain is rarely complained of. In the later forms, besides huskiness of the voice, there is often pain in the larynx. When ulceration is extensive there is tenderness on pressure over the thyroid cartilage, and the pain on swallowing may be very severe.

When stenosis is present, respiration is laboured, and hissing and wheezing are well marked; but this noisy respiration is not necessarily in proportion to the extent of the lesion. The voice is always more or less affected, sometimes even to complete aphonia. Œdema may complicate all forms of laryngeal disease both early and late, consequently any laryngeal trouble in a syphilitic patient should be estimated as important, for œdema may suddenly set in and jeopardise life (Krishaber). Sestier[2] collected 157 cases of chronic laryngitis, among which œdema glottidis occurred fourteen times through syphilitic inflammation. If ulceration have detached a portion of cartilage, some accidental displacement may cause fatal suffocation as in the cases already mentioned.

Diagnosis.—The early erythema of the larynx has no special character, and the diagnosis will depend on the presence of other signs of syphilis. The later affections have to be distinguished from tuberculous disease, and from epithelial cancer. The presence of syphilitic disease elsewhere, such as scars in the pharynx, is a usual though not a constant aid in determining the nature of the affection. But in doubtful cases the history of the case is generally helpful. In the later stages of syphilis, the ulceration usually attacks first the anterior portion of the larynx, travelling from the epiglottis and the arytæno-epiglottidean folds towards the interior of the larynx. In syphilis the development of ulceration is much more rapid than in *tuberculous disease*, in which throat symptoms usually

[1] Simyan: La Syphilis Laryngée tertiaire. Thèse de Paris. 1877, p. 34.
[2] Sestier; quoted by Lancereaux: Loc. cit., p. 312.

exist for several months before ulceration occurs. Another sign of syphilitic disease is the comparatively small amount of thickening with a wide extent of ulceration. In tuberculous disease, the larynx is greatly thickened, but the ulcers are small and numerous, and commonly pale pyriform swellings of the arytæno-epiglottidean folds are present. According to Stoerk[1] the tuberculous ulcer is never surrounded by a congestive areola, which is usually present with the syphilitic ulcer. Also the tuberculous ulcer has no tendency to heal at one side while it extends at another, which is not uncommon in the syphilitic form. A syphilitic ulcer also always tends to spread deeply; a simple catarrhal ulcer never does this, and a tuberculous one only in an advanced stage of general tuberculosis. When the epiglottis suffers in phthisis the posterior surface is most usually attacked, while in syphilis the anterior surface is generally affected (Mackenzie). More or less uniform thickening with pallor of the mucous membrane and small scattered ulcers are, according to Mackenzie,[2] the most characteristic features of laryngeal phthisis; but it must not be forgotten that both syphilis and tubercle may be present at the same time.

Epithelial cancer in a very large proportion of cases begins on the pharyngeal aspect of the mucous membrane covering the arytænoid or cricoid cartilages (Durham), and the affection progresses slowly. There is also considerable irregular thickening due to the development of the new growth. Stress is laid by Fauvel[3] on the development of small processes or tubercles around the ulcerating part, while ulceration does not destroy or dig out the tissue as does the necrosis which spreads through syphilitic deposits. Other distinctions of importance are the condition of the lymphatic glands, the acute pain, the suffering caused by swallowing and the copious secretion of mucus. Nevertheless, the distinctions of syphilitic disease from cancer or tubercle are sometimes so ill-marked that no diagnosis can be made until the effect of anti-syphilitic treatment has been tried.

Prognosis.—In the earlier forms the forecast is good; in most cases the catarrh and the mucous patches disappear spontaneously. It is true that acute œdema, the frequent cause of fatal termination in the later forms, may also, according to Krishaber, appear during the course of the earlier ones, thus rendering a close attention to the respiration throughout the duration of the affection necessary. In the later forms the prognosis depends much on the mode in which impediment to respiration comes on. If slowly, cicatricial

[1] Stoerk: Klinik der Krankheiten des Kehlkopfs. 1880, p. 340, *et seq.*
[2] Morell Mackenzie: Brit. Med. Journ. 1879, Aug. 23rd.
[3] Fauvel: Maladies du Larynx. 1876, p. 713.

contraction, over which medical treatment has little or no control, is indicated, and tracheotomy will often be required. Hence in these cases the termination depends much upon early recognition of the affection, in order that anti-syphilitic remedies may be applied while yet able to prevent the further development of the disease. On the other hand, when difficulty in respiration is rapid in development, œdema, capable of being checked by energetic anti-syphilitic treatment, is probable; and tracheotomy may thus be obviated even in cases attended by very severe symptoms. Krishaber[1] considers that in almost all cases of œdema of the glottis apparently excited by exposure to cold or similar agency, where there is no evidence of tuberculous disease, syphilis should be looked on as being the predisposing cause, and energetic anti-syphilitic treatment should at once be instituted.

The Trachea and Bronchi.—The trachea and bronchi are much less frequently attacked by syphilis than is the upper portion of the respiratory passages. Among 1145 patients suffering from syphilitic affections of the throat and air-passages observed by Mackenzie,[2] the trachea was affected in only three instances. Vierling[3] has collected forty-six cases of tracheal and bronchial syphilis. In thirty of these the pharynx and larynx, one or both, were also attacked. In thirty-six cases the trachea with or without the bronchi, and in five the bronchi alone, were affected. Two of the patients were under twelve years of age and their malady was inherited. The greater number of the remainder were between twenty and forty years of age. Many of the examples occurred in persons much exposed to irritation of the air-tubes, such as rag-pickers, carpet-beaters and the like.

Early affections of the trachea and bronchi are excessively rare; but in the few cases recorded, they were observed during the first six months after infection. Schnitzler,[4] indeed, urges that a bronchial catarrh due to syphilis is not uncommon at this time. The forms of disease which have been noted in the trachea are the same as those seen in the larynx, namely (a) simple catarrh, (b) mucous patches, and (c) shallow ulcers. In one of Vierling's collection of cases the mucous membrane of the trachea is described as being congested and dull red. Seidel[5] saw a papule opposite the fourth ring of the trachea in a man who had mucous patches of the fauces,

[1] Krishaber: Annales des Mal. du Larynx, &c. 1878, Sept.—Dec.
[2] Morell Mackenzie: Loc. cit., p. 531.
[3] Vierling: Deutsches Archiv für Klin. Med. 1878, Bd. 21, S. 326.
[4] Schnitzler: Die Lungen-Syphilis und ihr Verhältniss zur Lungen-Schwindsucht. 1880, S. 41.
[5] Seidel: Jenaer Zeitschrift f. Med. 1866, S. 489; and Gerhardt: Deutsches Archiv für Klin. Med. 1866—7, p. 535.

and other signs of syphilis. Shallow ulcers or erosions involving the mucous membrane are also stated to have been seen in the trachea in early syphilis.

Tertiary affections occur much more rarely in the trachea and bronchi than in the larynx. Though most frequent between four and eight years after infection, they are sometimes delayed until a much later period. Lancereaux[1] indeed mentions an instance of ulceration of the bronchi nine months after infection, but his account of the case does not show conclusively that the ulcers were syphilitic.

Moissenet[2] describes three circumscribed patches, irregularly rounded, as large as a sixpence, slightly raised, and pale yellowish in colour, situate three-fourths of an inch above a well-marked cicatricial narrowing of the trachea. Lancereaux also describes circumscribed gummata of the submucous tissue as being usually as large as a pea, but apparently he is not writing from his own observation. Beger[3] has reported a case in which a broken-down gumma was found in the trachea; there was also ulceration with stenosis at the bifurcation, and cylindrical dilatation of the bronchi. In another case there was an ulcer of the trachea which had perforated the œsophagus, leading to escape of food into the bronchi and fatal pneumonia. Wilks[4] found an ulcer in the trachea, one inch above the bifurcation. The ulcer spread through the whole thickness of the trachea and caused death by perforating the aorta.

Diffused hyperplasic thickening of the submucous tissue has been seen both with and without ulceration. Wilks[5] reports a case where the whole thickness of the trachea was infiltrated with hyperplasic deposit, the internal surface being ragged and flocculent.

Zeissl[6] describes the case of a patient who was under his care in the general hospital in Vienna for an ulcerating gumma of the lip, in whom dyspnœa came on gradually, and at last ended in death. At the necropsy, the larynx was found to be contracted, and the trachea so narrowed that a crow-quill would hardly pass. The mucous membrane was hard, tough and smooth without sign of ulceration.

In the bronchi ulcers have been found post mortem, scattered along the mucous membrane even as far as the smallest ramifications, where they became continuous (Lancereaux). Kelly[7] also has recorded a

[1] Lancereaux: Traité de la Syphilis. 1873, p. 319.
[2] Moissenet: L'Union Médicale. 1858, Nos. 128, 129.
[3] Beger: Deutsch. Archiv für Klin. Med. 1879, Bd. xxiii., Heft 5 and 6. Quoted by Zeissl in Virchow and Hirsch's Jahresbericht. 1880, Bd. ii., p. 533.
[4] Wilks: Path. Trans. 1865, p. 52.
[5] Wilks: Guy's Hospital Reports. 1863, p. 37.
[6] Zeissl: Lehrbuch. 1872, p. 211.
[7] Kelly: Path. Trans. 1872, p. 45.

case where an ulcer one inch in diameter, at the point of division of the right bronchus, perforated the pulmonary artery and caused death. There were also found in this case fibrous septa of the testis and gummata of the liver. Circular patches of ulceration along the trachea, and thickening of the mucous membrane, together with phagedænic ulceration of the larynx and necrosis of the cricoid cartilage were observed in a case reported by Norton.[1]

Woronichin[2] discovered at the post-mortem examination of a child fourteen months old, ulceration of the right bronchus and the neighbouring trachea reaching downwards as far as the next bifurcation.

Stricture or Stenosis is nearly always the consequence of the contraction following ulceration; though, as shown by the case of Zeissl already quoted, the ulceration is not indispensable. The narrowing may involve the whole circumference of the tube for a short distance, puckering or drawing the parts together so as to lessen its calibre to that of a goose-quill (Mackenzie).[3] Sometimes the narrowing is caused by tough white bands or by a membrane which spreads across the lumen as a cicatricial web. In some cases also there is a considerable thickening outside the air-tube producing a mass of cicatricial adhesions to the neighbouring structures. In some of these cases of stenosis, the trachea becomes dilated above and below the seat of stricture.

In the bronchi stricture is very rare. Verneuil[4] performed tracheotomy on a young man twenty-five years old, who died twenty-four hours afterwards. At the necropsy the left bronchus was found closely contracted by a scar reaching along its interior from the trachea to its first division. Pye-Smith[5] relates a case where both bronchi, just beyond the bifurcation of the trachea, were found much contracted and misshapen. Wilks[6] also has recorded an example of constriction of the right bronchus.

Abscess may be a consequence of ulceration spreading deeply through the wall of the air-tube. The suppuration may extend in various directions around and external to the trachea. In one case recorded by Lancereaux[7] the abscess was surrounded by a new growth of dense fibrous tissue in which lymphatic glands were embedded.

[1] Norton : Med. Press and Circular. 1880, April 28.
[2] Woronichin : Jahrbuch f. Kinderheilkunde. 1874. He also refers to a case of ulcer of the bronchus in a child reported by Hüttenbrenner. *Ibid.*, 1871.
[3] Morell Mackenzie : Path. Trans. 1871, vol. xxii., p. 33. See also Pugin Thornton : Path. Trans. 1874, vol. xxv., p. 41.
[4] Verneuil : L'Union Médicale. 1866, p. 462.
[5] Pye-Smith : Path. Trans. 1877, p. 336.
[6] Wilks : Guy's Hosp. Reports. 1863, p. 37.
[7] Lancereaux : Loc. cit., p. 206.

Perichondritis may arise by the extension of the morbid process from the more superficial structures; but it is said also to occur independently as a special lesion (Sechtem).[1] The inflammation usually causes abscess, ulceration and exposure of the cartilaginous rings, which may necrose, become detached and be coughed up piecemeal (Wilks and Moxon).[2]

Symptoms.—Usually the disease has made considerable progress before the patient suffers from more than capricious cough and perhaps slight dyspnœa. A tickling sensation or feeling of uneasiness behind the sternum is complained of by some patients. Later on, inspiration becomes difficult and sometimes accompanied by a hissing sound; still later, shortness of breath, especially when going up-hill or up-stairs, with nocturnal paroxysms of dyspnœa and dry cough appear. When ulceration is advanced or widely spread, the sputa are viscid, purulent, and occasionally bloody. If a bronchus is affected rather than the trachea, the respiratory murmur may be deficient in the corresponding lung. The voice is little or not at all modified. While the ulcers are healing the symptoms are less urgent; but when cicatrisation has caused stricture, the impediment to respiration returns in an aggravated form. The breathing becomes very laboured, and hissing or stridulous, and paroxysms of dyspnœa supervene. Death may take place during a violent paroxysm or by gradual exhaustion, or by pneumonia.

Diagnosis.—Dyspnœa, a hissing sound during inspiration, pain or sensation of a foreign body at a fixed point of the air-passage, added to syphilis, past or present in other organs, are characteristic signs. Later on, sudden attacks of difficult breathing without appreciable lesion of the lung are added. Auscultation of the trachea will, in some cases, define the particular position of the stenosis. The absence of change in the voice distinguishes the tracheal stenosis from laryngeal disease; moreover the condition of the larynx can be viewed by the laryngoscope. Tumours pressing on the trachea may be confounded with internal stricture, but careful examination of the neck and chest, and the history of the case will usually distinguish them from it.

The Prognosis is most grave if stricture supervene; the duration of the case is in proportion to the rapidity or slowness with which contraction takes place, but death, sooner or later, is inevitable.

The Lungs.—Disease of the lungs was ascribed to the venereal poison as early as the eighteenth century, but a knowledge of the precise affections which syphilis may excite is only of recent date,

[1] Sechtem: Wiener Med. Presse. 1878, Nos. 27—31.
[2] Wilks and Moxon: Path. Anat., p. 295.

and is even yet under dispute.[1] Goodhart[2] collected from the *post-mortem* records of Guy's Hospital 189 cases of visceral syphilis. In thirty-eight of these, chronic disease of lung was found, and in twenty-six of the thirty-eight the change was fibroid in nature.

No precise evidence has been collected to prove that the lung is attacked by early syphilitic affections, though one or two authors, among whom Schnitzler[3] may be mentioned, contend that a bronchial and lung catarrh is not uncommon during the period of early eruptions on the skin. But, this possibility excepted, which further investigation may establish or set aside, we have to deal with lung-syphilis only as a tertiary affection. When the lungs become affected in acquired syphilis, the most usual period for the development of the disorder is five or six years after contagion, but the interval is sometimes as long as ten or fifteen years; on the other hand, though rarely, the lung disease may show itself within the first twelvemonths. Such exceptional cases are those of patients in whom syphilis takes a precocious and pseudo-malignant course. In the lungs, as in other viscera, the two forms or types of new formation are (a) interstitial hyperplasia, and (b) circumscribed gumma.

In inherited syphilis the lungs have been found affected both with interstitial inflammation and with gummata in dead-born or very young children. It is also asserted that syphilitic disease of the lung may be one of the forms of tertiary disease which develope in children between the second dentition and maturity.

Interstitial Hyperplasia.—When attacked by this form of syphilitic disease, the lung is firmer at the seat of the deposit than elsewhere; it is also heavier and has a smoother surface. The whole organ may be involved, but most frequently only one lobe, or a portion of a lobe of one or both lungs is affected. The infiltrated parts are airless, greyish red or greyish yellow, smooth and homogeneous. In another form of the disease the lung is pale or whitish (the white

[1] The following list comprises the names of those who have contributed most largely to our knowledge of syphilitic disease of the lung:—Virchow: Constitut. Syphilis. 1859. Virchow's Archiv, Bd. xv.; and Krankhafte Geschwülste, Bd. 2. Wilks: Path. Anatomy; Guy's Hospital Reports, 1863; Medical Times and Gazette, 1862; Path. Trans., 1862, and subsequent years; and Wilks and Moxon: Pathol. Anatomy. 1875. Dittrich: Prager Vierteljahresschrift. 1850. Lebert: Anatomie Pathologique, 1857-61. v. Bärensprung: Die hereditäre Syphilis. 1864. Lancereaux: Traité de la Syphilis. 1873; and Bulletin de l'Académie de Médecine. 1877, Oct. 23. Wagner: Das Syphilom. Virchow's Archiv. Bd. xv. Foerster: Pathologische Anatomie. Beer: Eingeweide Syphilis. 1867. Pleischl and Klob: Wiener Med. Wochenschrift. 1859. Depaul: Mém. de l'Acad. de Méd. 1853. Cornil: Leçons sur la Syphilis. 1879. Rollett: Wiener Med. Presse. 1875. Grandidier: Berlin Med. Wochenschrift. 1875. Fournier: De la Phthisie Syphilitique; Gaz. Hebdomadaire, 1875; and Union Médicale. 1878. Shepherd: Gulstonian Lectures for 1876.

[2] Goodhart: Path. Trans. 1877, p. 318.

[3] Schnitzler: Loc. cit. See also Gamberini, who reports two cases in which he diagnosed early syphilitic disease of the lung. La Sifilide Pulmonare. Giorn. Ital. delle Mal. Ven. e della Pelle. 1880, Agosto.

hepatisation of Virchow). This change, rare in adults,[1] is the commonest kind of syphilitic lung affection in new-born children. As time goes on, the hyperplasic material becomes converted into a tough contracting fibrous tissue, which radiates or creeps among the lobules of the lung, draws together the bronchial tubes, and deforms and flattens or even obliterates them. The pulmonary tissue is thus replaced by firm fibrous tissue. This new growth may occupy only limited areas, or it may spread through a considerable part of a lobe. The lesion is frequently situated at the surface, so that when contraction has taken place, depressed, puckered, or stellate scars remain.

The change[2] begins in the interlobular connective tissue; at first small spindle-shaped and roundish cells appear, and quickly develope into connective tissue, among the fibres of which blood-vessels are freely produced. Thus is given to the new syphilitic growth what is claimed as a distinctive character, viz.:—its vascularity. In the early stages the new growth is intimately connected with, and somewhat concentrically arranged round, the interlobular blood-vessels and the smaller bronchi. The septa of the alveoli are thickened, and the alveoli themselves compressed. Similarly, the smaller bronchi become blocked by the pressure of the new growth, which may also develope along their lumen (Gowers).

The circumscribed gumma consists essentially of the same formation of cellular and connective tissue as the diffused form, with which indeed it is commonly associated. The elements are, however, somewhat differently arranged. Like the diffused infiltrating form, the circumscribed gummata appear to commence in the walls of the blood-vessels, or the smallest bronchi; at any rate they are intimately connected with them. The gummata are separated from the substance of the lung by a layer of fibrous tissue. They form nodules few in number, rarely more than six or eight, and not infrequently single: thus, they differ from tuberculous nodules, which are always numerous, and often countless. Gumma is usually present in only one lung, but may develope at any part of the organ, either on the surface or in the interior. It is, however, less frequent at the apex than elsewhere. It is common for one lobe only to be attacked, the remainder of the lung being quite healthy. The gummata appear as grey or yellowish-grey, hard, well-defined, masses, varying from the size of a hempseed to that of a walnut, but may be even larger. They soften at the centre by fatty

[1] Moxon: Guy's Hospital Reports. 1867.

[2] In the text, free use has been made of the admirable descriptions given in the Discussion on Visceral Syphilis at the Pathological Society in 1877, by Greenfield, Gowers, Goodhart, Pye Smith, and Mahomed, and recorded in the 28th volume of the Transactions.

degeneration, and then consist of diffluent contents enclosed in a limiting fibrous investment. The softening process commonly terminates in partial absorption, calcification and shrinkage. Such calcified masses are often seen embedded in the course of the seams of fibrous tissue produced by the infiltrating sclerosis. If communication with a bronchus occur, rapid evacuation of the mass takes place and a cavity is formed, which enlarges at first as the gumma breaks down, but afterwards shrinks, and in some cases finally closes, leaving a small fibrous scar with cheesy or cretaceous deposit.

Lancereaux[1] reports a case of gummata in both lungs where the *bronchial glands* were enlarged, firm, and pigmented. Schnitzler also mentions enlargement of those glands in syphilitic lung disease.

Virchow,[2] Lebert,[3] and others have described gummata in children suffering from inherited syphilis. Depaul[4] gives the cases of two children with pemphigus who had soft puriform nodules or collections scattered through the lungs.

Symptoms.—At the outset the affection is most insidious; there are no symptoms to draw attention to its development, nor can the infiltrating form be distinguished during life from the circumscribed gumma. Tickling in the throat is set down as an early symptom of pulmonary disease; but as syphilitic disease of the larynx is, according to Schnitzler, a usual accompaniment, the tickling and other symptoms, such as hoarseness, difficulty in swallowing, may depend on that. Difficulty in breathing is slight; cough, if present, is infrequent and dry, expectoration being absent or scanty. Physical signs are absent, or limited to weak respiration. Later on, where contraction of the interstitial tissue or softening has taken place, the symptoms and physical signs closely resemble those of tubercular phthisis. Dyspnœa increases, but is seldom very severe. The cough is paroxysmal, the expectoration grows purulent, and is tinged frequently by blood. In some cases, the patient may be capable of hard physical labour even though a considerable part of the lung be affected. Moxon[5] relates the case of a man employed in carrying sacks of grain, who was suddenly killed, and who had fibroid infiltration of a great part of the left lung and a part of the right, besides syphilitic scars in his liver and testes. The general condition also suffers; debility, pallor, and emaciation are present, though they appear to be less marked than in tuberculous patients with similarly grave physical signs. Towards the end,

[1] Lancereaux: Bulletin de l'Académie de Médecine. Oct. 23, 1877.
[2] Virchow: Krankhafte Geschwülste, Bd. ii., p. 468.
[3] Lebert: Anatomie Pathol. Planche 152.
[4] Depaul: Mém. de l'Académie de Méd. 1853, p. 135.
[5] Moxon: Path. Trans. 1871, p. 38.

hectic and night-sweats come on, and the patient becomes gradually exhausted and dies. In a paper based upon an analysis of sixty cases of pulmonary affection in syphilitic persons, Reginald Thompson[1] describes the symptoms as chiefly consisting of marked dyspnœa after exertion, slight hæmoptysis, and expectoration, which was sometimes abundant. The physical signs were dulness on percussion, and a peculiar alveolar rustle resembling the sound produced by the crumpling of thin paper, together with bronchial breathing and bronchophony. These were accompanied by cachexia and by other evidence of syphilis.

The course of the disease is usually slow. If not arrested by specific treatment, the length of time occupied by its progress varies between one year and two years before life is threatened.

Diagnosis.—This depends mainly on the previous history, and on the presence of syphilis elsewhere. But the following distinctions may in some cases assist in separating syphilitic from tubercular phthisis :—

Syphilitic affections may attack any part of the lung, but seem to have a predilection for the middle and lower lobes. Grandidier[2] in twenty-seven of thirty cases found the induration affecting the middle lobe of the right lung. Indeed, he says that dulness in this region with resonance at both apices is diagnostic of syphilis. Tuberculous disease usually, as is well known, first affects the apices of one or both lungs. Again, the dulness is most frequently confined to one lung, and the larynx is usually also affected, in syphilitic disease. When this is the case, the laryngeal affection is often of the greatest value in the determination of the nature of the pulmonary affection. The effect of treatment also can be watched by means of the laryngoscope. Schnitzler[3] records five cases where he was able to do this, and where recognition of the syphilitic nature of the laryngeal affection led to a correct diagnosis of the disease of the lung. Often, however, the symptoms so closely resemble those of tubercular phthisis, which disease may be itself present in a syphilitic patient, that the syphilitic origin of the affection can only be surmised from the effect of treatment.

The prognosis depends on the discovery of syphilis as the cause of the disease, and on the consequent appropriate treatment. In a case recorded by Fournier[4] where dulness at the summit of the left lung was extensive and signs of a cavity distinct, after six weeks of anti-syphilitic treatment recovery was almost complete; the sole

[1] Reginald Thompson : Brit. Med. Journ. August 28, 1880.
[2] Grandidier : Berlin Klin. Wochenschrift. 1875, No. 15.
[3] Schnitzler : Loc. cit.
[4] Fournier : Phagedénisme tertiaire du Pied, &c. L'Union Médicale. 1878.

physical signs left were a few moist crackles. In this case the presence of a phagedænic ulcer of the foot was the only sign that suggested syphilis; the symptoms of the pulmonary affection being identical with those of tubercular phthisis. When, as often happens, the syphilitic origin of the lung disease is not diagnosed, the patient slowly gets worse, and sooner or later dies of exhaustion, if not carried off by some intercurrent affection.

SYPHILIS.

CHAPTER VII.

THE CIRCULATORY SYSTEM.

The Heart.—There is no evidence that the heart is affected by lesions analogous to those of the secondary stage. Certain authors have attributed irregular function of the heart to the influence of the syphilitic virus, but base their opinion on no exact observation. Hence all the known syphilitic affections of the heart and its pericardium are tertiary in nature, though sometimes precocious in the time of their appearance. The age of the patient and the source of infection do not determine the implication of the heart, for it has been found, post mortem, to be affected both in inherited and in acquired syphilis. With regard to the period after infection, Grenouiller[1] collected twenty-four cases of gummy heart disease; the mean time of occurrence in eighteen cases was ten years after infection. But Grenouiller also noted an instance of cardiac affection in the first year after contagion. Hutchinson[2] has seen two cases of myocarditis and gumma in patients who died during the course of the general eruption of the skin.

The Pericardium.—Syphilitic affections of this envelope are rarely seen. Virchow[3] has described membranous adhesions between the serous surfaces, and Lancereaux,[4] a thickening of the membrane, resembling the interstitial hyperplasia of parenchymatous organs, in patients where myocarditis or gumma was present. Lancereaux has also recorded a case where a gumma as large as a cherry-stone formed in the pericardium. This comprises all that is at present known on the subject.

[1] Grenouiller: Étude sur la Syphilis Cardiaque. 1878.
[2] Hutchinson: London Hospital Reports. 1866, p. 382; and Path. Trans. 1876, p. 347.
[3] Virchow: Ueber der Constitutionellen Syphilis. 1859.
[4] Lancereaux: Traité de la Syphilis, p. 295.

The muscular substance of the heart, like other muscles, may be attacked by interstitial hyperplasia and circumscribed gumma. Besides these special affections there are some others, not peculiar to syphilis, which may affect the heart in syphilitic persons, namely, fibrous adhesions of the valves or chordæ tendineæ, and vegetations. There may be, moreover, according to Lancereaux,[1] a change in the muscular substance resembling lardaceous disease.

The interstitial form is generally, if not always, associated with the circumscribed form. In the parts affected, the muscular fibres are replaced by a dense, bluish-white fibrous tissue. In a case described by Virchow, the endocardial surface of the ventricle was tough, irregular, and beset with nipple-like projections. The chordæ tendineæ were shortened, and the musculi papillares almost entirely converted into hard, flattened, whitish cords. The anterior segment of the mitral valve was also thickened. Lancereaux has noted this fibrous degeneration passing in bands across the muscular fibres, which he likens to the lineæ transversæ of the recti abdominis muscles. In a case of Coupland's,[2] that of a child three months old who had gummata of the liver and lung, the myocardium was very firm and resisting, and of a uniform pale pinkish-yellow tinge. The walls of both ventricles and the septum were very thick and cut with a creaking sound. Microscopic examination discovered in all parts extensive infiltration of small round cells imbedded in a structureless matrix between groups and bundles of muscular fibres. Ehrlich[3] has recorded the occurrence of simple infarcta in the muscular tissue of the left ventricle of a heart widely attacked by myositis, in a man whose body showed copious evidence of syphilitic disease elsewhere.

Hypertrophy of the ventricles with dilatation, combined with or consequent on aortic or mitral insufficiency, has been recorded by Graeffner[4] in a patient who had the remains of a gumma in the septum ventriculorum and interstitial myositis, with evidence of syphilis elsewhere. Hertz[5] has also recounted a case of early dilatation with hypertrophy, in which myositis was found in the ventricles post mortem.

Circumscribed gummata have been long recognised, Ricord in his Clinique Iconographique, having been the first to depict them. They resemble in every respect gummata elsewhere. Jullien[6] has tabulated nineteen cases of gumma of the heart, some of which are,

[1] Lancereaux : Loc. cit., p. 299.
[2] Coupland : Path. Trans. 1876, p. 303.
[3] Ehrlich : Ueber syphilitische Infarcta. Zeitschrift f. Klinische Medizin. 1879, Bd. 1, 2tes heft, p. 378.
[4] Graeffner : Deutsches Archiv für Klinische Medizin. 1877, Bd. 20, p. 611.
[5] Hertz : Virchow's Archiv. 1873, Bd. 75, p. 421.
[6] Jullien : Maladies Vénériennes. 1879, p. 894.

however, doubtful from the imperfection of their history of syphilis. In eleven of Jullien's collection the gumma was in the left ventricle. In eight the tumour was in the right ventricle, in three in the right auricle, and in two in the septum ventriculorum; one of these was Wilks'[1] case. The masses vary in size from a pea to a pigeon's egg. They are seated among the proper muscular fibres or in the new invading interstitial tissue. Most frequently they are numerous, rarely single. They may be firm or cheesy in consistence, greyish, or yellowish in colour, round or oval in shape, and are enclosed in a tough vascular envelope. They may present every stage of fatty degeneration. By softening gradually they may open into the cavity of the ventricle and thus produce embolism or general infection from the admixture of their contents with the circulating blood. Oppolzer[2] reports a case where a patient became suddenly hemiplegic and died shortly afterwards. Post-mortem, plugging of an artery in the Sylvian fissure and softening of the middle lobe of the brain were found. In the heart, beneath the aortic valves, two small apertures led into a cavity which would lodge a bean, and which had been left by a softened gumma. Oily degeneration may affect the muscular fibres themselves as well as the new growth.

Gummata of the heart in *inherited syphilis* have been noted a few times.[3] Woronichin[4] found one the size of a hazel-nut projecting into the left ventricle near the apex, in a child fourteen months old. Parrot[5] has also seen gummata of the heart in a new-born infant.

Symptoms.—These have rarely been noted before sudden death, the usual termination of the affection, has drawn attention to the condition of the heart. But palpitation, systolic *bruit*, irregular pulse and cyanosis of the extremities have been set down in the clinical histories of certain of the patients whose death was caused by syphilitic disease of the heart. The progress is slow and insidious; the affection probably always terminates fatally. G. Mayer[6] of Aix-la-Chapelle has adverted to the clinical aspects of syphilitic diseases of the heart, and has detailed a number of symptoms which denote weakness of the heart's action, but which are said to be especially common in syphilitic disease of the heart.

The Diagnosis depends on the presence of syphilis and the absence of murmurs due to valvular deformity. But probably in few cases can any diagnosis be made.

[1] Wilks: Guy's Hospital Reports. 1873, p. 42.
[2] Oppolzer: Schmidt's Jahresbericht. 1860, p. 89.
[3] Rosen: Behrend's Syphilidologie. 1860, Bd. iii., p. 249.
[4] Woronichin: Jahrbuch f. Kinderheilkunde. 1874, 1 heft.
[5] Parrot: Progrès Médical. 1878, p. 873.
[6] G. Mayer: Ueber heilbare Formen chronischer Herzleiden, &c. Aachen, 1881, p. 25, *et seq.* Mayer appends a list of German observers who have recently recorded syphilitic affections of the heart.

Prognosis.—In nearly all the cases where gummata have been found post mortem, death has been from sudden arrest of the heart's action. This was the mode of death in thirteen of Jullien's collection as well as in several other cases.[1] In other instances, dyspnœa, hemiplegia and exhaustion[2] are given as the immediate cause of death.

The Blood-vessels.—Syphilis produces certain peculiar changes in the blood-vessels distinct from ordinary atheroma, though the latter affection, or at least its fibrous nodular variety, is frequently present in the arteries of syphilitic persons: this will be reverted to presently.

The Veins.—Little is yet known respecting the nature or extent of syphilitic disease of the veins. Probably they are affected by changes similar to those prevailing in arteries. Dowse[3] describes having found in a case of syphilitic disease of the tentorium cerebelli and neighbouring brain, a new growth extending along the lumen of all the sinuses except the occipital. Deakin[4] found the portal vein lined with a dense white membrane, in a patient who died of syphilis; the ramifications of the portal vein, as well as those of the hepatic artery and duct were much contracted. A large gumma of the liver compressed the portal vein.

In a woman recently infected by syphilis, whose case is reported at length by Huber,[5] the cause of several peculiar symptoms during life was found post mortem to be a thickening and calcification of circumscribed patches along the course of the larger veins of the lower extremities, and to a less extent of those of the upper extremities, of the portal vein and pulmonary artery and of all the systemic arteries to their smaller ramifications, except the aortic arch, the coronary arteries, and the arteries of the brain. Though we quote this remarkable case, we cannot accept it as an unquestionable instance of syphilitic disease of the blood-vessels in the present state of our knowledge of these affections.

Birch-Hirschfeld[6] has found the inner coat of the umbilical vein in syphilitic fœtuses affected with proliferation of cells similar to that to be presently described as occurring in the arteries. The stenosis thus produced has been suggested by Oedmansson[7] to be a cause of the death of the fœtus in utero. Schüppel[8] has described

[1] See Barthol. Hosp. Reports. 1872, p. 183. Cayley: Path. Trans. 1875, p. 32. Gould: Path. Trans. 1876, p. 69. Stephen Mackenzie: Med. Times and Gaz. 1879, vol. i., p. 281.
[2] Morgan: Dublin Quarterly Journal of Medical Science. 1871, vol. 52, p. 42.
[3] Dowse: Path. Trans. 1876, p. 12.
[4] Shirley Deakin: Lancet. 1879, April 19, p. 552.
[5] Huber: Virchow's Archiv. 1880, Bd. lxxix., 3ter heft, S. 537.
[6] Birch-Hirschfeld: Wiener Med. Wochenschrift. 1875, S. 555.
[7] Oedmansson: Nordiskt Archiv. I. 4, p. 73; and Archiv für Gynaekologie. 1870, p. 523.
[8] Schüppel: Archiv der Heilkunde. 1870.

changes of the large branches of the portal vein in three syphilitic children. The vein was converted into a thick cord still retaining a narrow lumen. The alteration of the walls consisted in greyish yellow opaque thickening of the inner coat, while the thickening of the outer coat was due to proliferation of the cellular tissue, which was inseparably connected with the surrounding parts. Mewis[1] found contraction of the umbilical vessels, especially of the veins, in forty-nine of ninety-two macerated fœtuses. In thirty-seven the intima was thickened.

In the Capillaries, Lancereaux[2] has remarked that in syphilitic persons fatty degeneration of these vessels is frequent. Greenfield[3] describes the capillaries of a gumma of the brain as well as the small arteries, to have been thickened and even entirely obstructed by proliferation of the endothelial cells composing their walls.

The Arteries.—Though investigations have been carried much further into the changes caused by syphilis of these vessels than into those occurring in the veins and capillaries, little was certainly known until lately. From time to time cases of disease of the arteries in syphilitic persons, chiefly cases of obstruction of cerebral arteries, had been recorded.[4] Weber[5] and Virchow[6] noted partial obstruction of the pulmonary artery in patients who had extensive visceral syphilis elsewhere. But the true nature of the change excited by syphilis in the coats of the vessels, though indicated by Virchow,[7] was first clearly set forth by Heubner,[8] whose description, combated at first for its novelty, is now pretty generally accepted, and was almost completely adopted by the observers who led the discussion on visceral syphilis at the Pathological Society in 1877.[9] Baumgarten[10] also, who differs from Heubner in believing that the adventitia, and not the intima, is the first part of the vessel to be attacked, closely follows the latter in describing the changes produced by syphilis in the smaller arteries. These changes have been found

[1] Mewis : Zeitsch. f. Geburtshülfe ü. Gynaekologie. 1879, p. 43.

[2] Lancereaux : Traité de la Syphilis, p. 310.

[3] Greenfield : Path. Trans. 1877, vol. xxviii., p. 279.

[4] The following authors were among those who prepared the way for the more exact researches of later years. Virchow : Ueber der Constitutionellen Syphilis. 1859. Gros et Lancereaux : Des affections nerveuses syphilitiques. 1860. Wilks : Guy's Hospital Reports. 1863. Fagge : Lancet. 1869, vol. ii., p. 435. Moxon's description of the naked-eye characters of the basilar artery in this case shows it to have been a typical example of the thickening peculiar to syphilis. Clifford Allbutt : Path. Trans. 1872. Allbutt described the change which attacks the adventitia and perivascular tissue in the pia mater.

[5] C. O. Weber : Verhandlungen der Niederrheinische Med. Gesellschaft. 1863. S. 171.

[6] Virchow : Krankhafte Geschwülste, Bd. ii., p. 444.

[7] Virchow : Virchow's Archiv, Bd. xv.

[8] Heubner : Die luetische Erkrankung der Hirnarterien. 1874. Heubner has collected fifty cases, some being his own, and supplies a full bibliography.

[9] Path. Trans. 1877, vol. xxviii. Descriptions and drawings were furnished by Greenfield (see also his further researches in 1878, Path. Trans., vol. xxix., p. 10), Gowers, Barlow, and Buzzard.

[10] Baumgarten : Archiv der Heilkunde. 1875, S. 452, *et seq.*

in infants and children by Barlow, but they are most frequently seen in adults. Of Heubner's cases, the age is mentioned in forty: in twenty-one of them it ranged between thirty and forty years. The time after infection is seldom exactly noted; but where this interval was ascertained the most usual period was five years. On the other hand, in two patients, twelve and twenty years are recorded to have elapsed between infection and death.

Seat.—The larger vessels—aorta, iliac, axillary and brachial arteries—may be free from any kind of disease when the small vessels of particular viscera are affected by changes peculiar to syphilis. Or the large trunks may be scantily or extensively invaded by ordinary atheroma with its customary fatty and calcareous changes, when smaller visceral arteries are or are not affected by special changes. Such atheromatous affections, of course, are not specially due to syphilis, though from the frequency of their presence in syphilitic patients it is fair to suppose that that disease may be a predisposing cause of atheroma. By producing atheroma, syphilis probably indirectly occasions aneurism of the main trunks—an affection which there has been a strong tendency of late years to attribute directly to syphilis.

The special changes are most frequently observed in the arteries at the base of the brain, and in the offshoots from them into the brain and pia mater, such as the internal carotid, vertebral, and basilar arteries and those of the circle of Willis. But the smaller vessels of the kidney, skin, larynx, and other parts of the body, have also been observed to be affected by interstitial thickening of their coats.

Syphilitic affections of the main arteries are less perfectly recognised. Sutton [1] has reported the discovery in the aorta of a boy of fourteen, the subject of congenital syphilis, of two white, slightly nodular elevations on the inner surface near the semilunar valves. The artery elsewhere was not affected, nor was any ordinary atheroma present. Lancereaux [2] mentions one instance of the subclavian artery being shrunken, white, and almost wholly blocked in a patient who had elsewhere copious evidence of visceral syphilis.

Bristowe [3] has recorded a case of gradual loss of pulsation in both arms, and its almost complete loss in both carotids, in a syphilitic man who had paralysis of one arm and of one side of the face. Proust [4] also narrates an example of sudden blocking of the circulation through the left axillary artery in a patient who had previously

[1] Sutton: Path. Trans. 1877, vol. xxviii., p. 304.
[2] Lancereaux: Traité, &c., p. 309.
[3] Bristowe: Med. Times and Gazette. 1877, vol. i. p. 143.
[4] Proust: L'Union Médicale. 1878, Juin 29.

had syphilis. But the evidence that the artery was affected by syphilis in these cases is imperfect.

Structural changes.—Examined by the naked eye, an artery affected with syphilitic degeneration appears much contracted, being for half an inch, or perhaps for more than an inch of its course narrower, firmer, and less supple or elastic than natural. When the change is well-marked, the artery becomes a stiff, white, opaque tube (not unlike boiled macaroni, Moxon). If greatly thickened, the lumen may be blocked so completely that for a short part of its length, blood cannot be forced along its interior. When the change involves the walls of the vessel less completely, the syphilitic new growths appear as hard round grains, or oat-shaped masses, on its wall; in other cases, the unequal thickening of the walls often throws the vessel into a twisted form. When the artery is cut open, thrombi are frequently met with, blocking completely the channel already narrowed by the inward projection of the thickened wall.

Recent thrombi can be removed from the wall of the vessel and the endothelial lining will be found still smooth and unbroken beneath. Sometimes, near the thickened patches, the artery is widened by an aneurismal bulging of the wall at places where it is not yet thickened by new growth. At these widened parts, nevertheless, the coats may be neither broken nor frayed. A cross section of the vessel shows the lumen at the thickened points, to be no longer circular as in health, but flattened, curved, or otherwise compressed; while the thickening of its walls is rarely equally distributed round the vessel, but usually greater at one than at the other side. Complete occlusion may take place, either suddenly by thrombus or more slowly by gradual bulging inwards of the walls. The final change in the condition of the vessel is fibrous degeneration of the syphilitic new growth until all trace of a tube is lost, and nothing more than a shortened, shrunken, white and brittle thread of connective tissue remains.

Minute changes in the structure of the artery.—When microscopically examined, it is seen that the alteration in the coats of the vessel begin in the tunica intima and in the tunica adventitia; while they affect the tunica muscularis by extension from the adventitia.

The process is best observed by examining the *intima* of the smaller arteries, such as those forming the circle of Willis and their offsets. Partaking of the characters of sclerosis or the infiltrating gumma, the development of this change has been minutely described by Heubner, whose account in its main features is confirmed by Greenfield, Gowers, and others who have more recently investigated the matter.

The new growth begins at certain circumscribed areas of the wall of the artery between the endothelium and the fenestrated layer. The free surface of the endothelium remains unaffected, if not through-

out the process, certainly until a very late stage of the alterations produced in the artery is reached.

The first change is a multiplication of the nuclei of the cells of the endothelium where it is attached to the membrana fenestrata. Thus is produced, at a limited area, a gradual separation of the endothelium from the fenestrata by accumulation of new nuclei. This thrusts inwards the endothelium into the lumen of the artery. Hence, narrowing of the vessel's calibre takes place from the first. Around the multiplied nuclei a protoplasm forms, and in this protoplasm are generated cells, mostly spindle-shaped or stellate, which gradually arrange themselves into layers. The further development now consists partly in multiplication of these cells, and partly in a further formation of nuclei from the endothelium. The cells are dispersed in the gaps of the fenestrata and perpendicular to the lumen of the vessel, though the cells contiguous to the fenestrata still remain in layers parallel with that membrane. By this growth of cells the inward bulging of the endothelium is still further increased.

As the process advances, the greater portion is formed of thick layers of stellate interlacing cells, among which giant cells[1] are occasionally seen. Internal to the interlacing layers the cells are fusiform and set in rows perpendicular to the long axis of the vessel. When the arrangement of the two layers—the thick outer band of interlacing cells and the narrow encircling band—is nearly complete, a new form of cell is seen to be permeating the mass, namely, small round cells. These cells Heubner believes to be simple inflammatory cells that have wandered from the neighbourhood of the vasa vasorum of the adventitia, through the muscular coat and through the fenestrata until they reach the new growth arising from the endothelium.

This accidental, or at least accessory addition of inflammatory round cells, gives to the section of the new growth in the intima, a close resemblance to the granulation tissue that is produced in all vascular tissues by syphilitic irritation.

As the thickening of the intima increases, so does it project into the lumen of the vessel; and it gradually extends from the point of first origin in all directions, encircling the vessel and spreading along its walls, and along those of its branches as they are reached. But the thickening grows unequally, and thus alters the shape of the vessel in a peculiar manner, rendering the artery not simply narrower and less capable of expansion during systole, but also flat or bowed. The endothelium, too large in its original state for the diminished internal surface of the artery, shrinks, mainly by its superfluous cells being used up in making the new growth, but

[1] Baumgarten, loc. cit., confirms Heubner in this.

possibly in part by a contraction of the cells themselves; for throughout the alterative process, the endothelium preserves its character of a delicate single layer of cells.

The diminution of the vessel's calibre may become extreme, so as to reduce the lumen of a comparatively large vessel to that of a mere capillary without the production of any thrombus. Still thrombus may be suddenly formed in a vessel which has lost but little of its original calibre.

Occasionally, when a large trunk is greatly narrowed, the smaller collateral branches are distended by the pressure of the current in the vessel. Should one of these over-stretched twigs have undergone some loss of elasticity by the syphilitic change in its intima, without also losing much of its capacity, its intima at the diseased area, no longer capable of withstanding the strain of the blood's pressure, may split and allow blood to escape into its coat between the new thickening and the fenestrata,—thus producing a kind of dissecting aneurism. If the external coat be also much affected, the blood may escape from the artery and produce hæmorrhage into the tissue—the cerebral tissue, for example.

It must be borne in mind that the changes of structure of the intima, however great a thickness the coat may thus gain, are always limited to the space between the original fenestrata and the original endothelium. This increase may be more than double that of the middle and outer coats together.

In large vessels occasionally, but very rarely, the fenestrata has been observed to be ruptured; in such a case, the new cellular growth may overflow outwards, so to speak, through the gap into the muscular coat.

When the new growth has reached this stage of development it becomes vascular. Fine capillaries may be traced through it, always running parallel with the long axis of the artery: at first these new vessels appear only in the part nearest the fenestrata, that of oldest formation, but ultimately throughout the mass. Though charged with simple fluid at first, the new capillaries are soon found to be filled with blood. Heubner describes the capillaries of the intima as being elaborated in the tissue independently of any branching of the capillaries of the adventitia. Be this as it may, at no distant time, capillaries may be traced penetrating the muscular coat and branching in the new thickening of the intima.[1]

After this stage is reached, a still farther development is occasionally remarked; Heubner explains this by supposing that the influence of syphilis over the development of new tissue ceases

[1] Greenfield's drawings, Path. Trans., vol. xxviii. 1877, Pl. XIII., p. 272.

either permanently or temporarily. During this pause, a new layer of normal elastic fibres resembling the old fenestrata forms under the endothelium. When this is accomplished, the syphilitic tissue lies between the old fenestrata on the outer side, and a new one lying next to the endothelium. In a longitudinal section of an artery, the translucent waving line of the old fenestrata, thrust irregularly from the lumen of the vessel by the syphilitic growth, is distinctly seen; and, when a second fenestrata has been produced, a second bright sinuous line appears at the inner margin of the morbid growth close to the endothelium. If the syphilitic influence again become active, this new band of waving elastic fibres is in its turn separated from the endothelium by a new zone of syphilitic tissue. Greenfield,[1] who has figured this repetition, has observed it to consist partly of cells, but to a greater extent of delicately fibrillated connective tissue. Thus, after a temporary pause, the syphilitic influence again directs development and the endothelium may still further proliferate tissue that adds to the coarctation of the vessel.

So far, the production of new tissue has been onward, not retrograde; and it must be remarked that no mention has been made of fatty degeneration in the new cellular tissue of the intima. This is a rare occurrence, but it may take place; Gowers[2] has depicted a nodule the size of a pea, formed by enormous thickening of the inner coat of a branch of the artery in the Sylvian fissure, where a small centre of commencing caseation is shown. The more usual change when further alteration is produced, is fibrous degeneration and shrinkage of the new tissue. When this change ensues, the interlacing stellate cells become more and more loosely fitted to each other, leaving large intercellular spaces, which are gradually charged with a firm material. The layers of cells near the lumen of the vessel become still more obviously arranged in rings around the artery. The simple round cells, which thus far have remained plentiful, now disappear from the new growth of the intima, though they may be still detected in the adventitia. The next change of the morbid tissue is to lose many of its cells and to greatly increase its amount of firm intercellular substance. Lastly, this intercellular substance becomes fibrous, and the development into fibrous tissue is achieved. The new tissue then shrinks, both becoming denser, and also still further contracting the lumen of the vessel even to its complete closure. If, before closure has become perfect, a thrombus block the passage, the clot undergoes organisation or absorption, leaving nothing but a few pigment cells to mark its former presence. The fenestrata, much twisted and bent, encloses a cylinder of more or

[1] Greenfield: Path. Trans. 1877, vol. xxviii., p. 275.
[2] Gowers: Path. Trans. 1877, vol. xxviii., Pl. XVI.

less dense connective tissue which, by reason of the capillaries developed in it, still retains some vascular structure.

The muscular coat has been hitherto little affected while the internal and external coats have been altered in structure; whatever change its substance undergoes being caused by invasion of cells, generally from the adventitia, rarely from the intima through a rupture of the fenestrata. When contractile fibrous degeneration is advanced in the intima the muscular coat undergoes atrophy. The contractile cells disappear and leave a network of elastic spiral threads, or even this may disappear also.

The last to be changed is the *fenestrata*. This is converted into cellular tissue.

The Adventitia.—The changes here appear to be limited to a production of small round nucleated cells about the size of colourless blood-corpuscles and of a delicate stroma. These cells are first visible about the capillaries. The cells and stroma develope into a highly vascular cellular tissue which causes the adventitia to be somewhat thicker than natural at irregular situations along the vessel. The new tissue extends inwards into the muscular coat, and outwards in the peri-vascular cellular tissue, where it may form distinct circumscribed gummy nodules. Indeed, with this exception, the change in the adventitia is by no means peculiar to syphilis, being in all its essential characters that of simple chronic inflammation.

When all the constituents of the walls have degenerated, a thin, somewhat brittle fibrous thread is the sole remnant of the artery.

Distinctions between syphilis and atheroma.—The distinctions of the special syphilitic changes in the arteries from atheroma are well marked.

The syphilitic change is speedily developed; a few months being sufficient to cause great thickening of the coat and consequent narrowing of the lumen. The exact rate of progress of atheroma is not known; but it is certainly slow, and probably requires years for its development in most cases. The syphilitic process from the first causes narrowing of the artery, while in atheroma the vessel is widened very early. The development of the syphilitic change is a more localised affection, indeed it may be limited to a short length of only a single vessel; and usually only the smaller arteries of a single organ or locality are affected. In atheroma, the larger arteries are first diseased. The site of the commencement of the morbid change is different in atheroma; this may be well seen in an artery such as the basilar, where the fenestrated layer is well developed. Atheroma begins by the production of nuclei in the gaps of the fenestrated membrane, which collect closely between it and the endothelium.

But from the first these nuclei, and afterwards the cells produced around them, are surrounded by a plentiful protoplasm of striated appearance. In short, the first effect of atheroma is to multiply the layers of elastic membrane. Thus a marked distinction is evident at once between the earliest development of atheroma and that of the syphilitic change. In the latter, the new formation is cellular during all its early development, and protoplasm is only scantily provided. But another clear distinction is the rapid fatty degeneration in atheroma of these new layers of cells and protoplasm, by which the artery is soon beset with patches of rigid whitish material, consisting partly of fat and partly of calcified granules, of which the appearance is well known.

The relation of syphilis to aneurism of the main trunks is still extremely ill-defined. There is good reason to believe that syphilis is a predisposing cause of atheroma, and doubtless atheroma is often the starting point for subsequent aneurism. Welch[1] collected from the records of Netley fifty-three cases of aortic pouching or sacculation, in thirty-four of which the dilatation had developed into aneurism. In sixty-six per cent. of the fifty-three cases, the patients had been undoubtedly infected with syphilis. It must be borne in mind that all these examples were taken from soldiers, a class particularly liable to vascular disease; but examination of their cases did not show any other factor than syphilis to have prevailed. Welch goes further than this: his researches show that the nodular circumscribed form of atheroma is the one most frequently developed in the larger vessels of syphilitic patients, while it is the exceptional form in the rheumatic or chronic alcoholic diathesis. Cases are recorded where aneurisms of the larger vessels have been discovered by post-mortem examination in syphilitic persons; but the connection between such aneurism and the syphilitic condition of the patients has never been quite successfully traced. Wilks and Moxon[2] call attention to this want of completeness in the chain of evidence, and point out that in the various post-mortem records of women who have had syphilitic disease during life, aneurism is rarely noted. At the discussion which followed the exhibition of a specimen of multiple aneurisms of the aorta, by Vallin,[3] at the Société Médicale des Hôpitaux in 1879, Fournier expressed his belief that syphilis may be a predisposing cause of aneurism by its tendency to excite atheromatous degeneration of the arteries, and said that he had observed an aneurism of the aorta in a patient who had syphilitic periostitis.

[1] Welch: On Aortic Aneurism in the Army, Med. Chir. Trans. 1876, vol. lix., p. 59.
[2] Wilks and Moxon: Pathol. Anatomy, p. 147.
[3] Vallin: L'Union Méd. 1879, Juin 24.

Aneurisms of the smaller arteries, however, especially of those of the brain, have been observed in syphilitic persons quite independent of athroma. Russell,[1] for example, has reported a case where he found an aneurism of the basilar artery one inch and a half long and one inch broad. In the same patient there was also a smaller aneurism of a branch of the right middle cerebral artery. Lancereaux,[2] Heubner, Chvostek,[3] and others have also reported cases of aneurism. In Chvostek's case there were aneurisms of the left Sylvian, the basilar, the crural, popliteal, brachial, hepatic, splenic, lumbar, and other arteries. The patient was a soldier, twenty-three years old, who had extensive syphilitic disease elsewhere.

THE LYMPHATIC SYSTEM.

The Lymphatic Vessels.—Next to nothing is known of syphilitic affections of these vessels beyond what has been described in connection with the initial manifestation (see Chapter III.). Two cases reported by Hutchinson [4] in which long-continued lymphatic œdema followed trivial injury of the lower extremity in syphilitic persons, seem however to invite further research into the possible influence of late syphilis on the lymphatics. In one of these cases marked improvement took place under mercurial treatment.

The Lymphatic Glands.—The affections of these glands which occur during the primary and secondary stages of syphilis have been already noticed; but before proceeding to consider the tertiary or gummy forms, we may remark that the glandular enlargement during the earlier period of the disease, instead of remaining moderate, may, in certain rare instances become excessive, the glands occasionally increasing to the size of a pigeon's egg or even much beyond.

Among the out-patients at the Lock Hospital there was, in 1876, a man in whom both supra-clavicular spaces were occupied by a mass of large soft glands. The man was undoubtedly syphilitic, and was pale and wasted. Under specific remedies the enlargement of the glands completely subsided.—A. C.

When this excessive enlargement takes place the glands are not hard but doughy, and they occasionally suppurate. When suppuration occurs it is usually in scrofulous patients or in those of so-called lymphatic temperament; but in some cases no apparent cause

[1] Russell: British Med. Journ. 1870, vol. ii., p. 87. See also MacLean: Brit. Med. Journ. 1876, vol. i., p. 283.

[2] Lancereaux: Loc. cit., p. 403. The dilated artery was the basilar. See also certain of the cases collected by Heubner: Loc. cit.

[3] Chvostek u. Weichselbaum: Allgemeine Wiener Medicinische Zeitung. 1877. Nrs. 28, 29, 30, 32, 33, 34.

[4] Hutchinson: Lancet. 1876, vol. ii., p. 284.

can be made out. In connection with this may be mentioned the occasional occurrence of retro-pharyngeal abscess in syphilitic persons. This has been noticed by Fournier[1] as well as by Péan. It may perhaps be due to suppuration of the gland situated in front of the body of the axis.

The disease known as general Lymphadenoma or Hodgkins' disease, does not appear to have any special connection with syphilis. In only three cases out of a hundred collected by Gowers,[2] was lymphadenoma ascribed to syphilis.

Glandular enlargement in the tertiary period, may accompany syphilitic lesions of the viscera or may be due to gummy deposit in the gland without any obvious exciting cause. Gonnet[3] has collected nine cases of gummy disease of the lymphatic glands. Lancereaux[4] states that the deeper glands are more often affected than the superficial, and that he has noticed enlargement of the iliac, lumbar, cœliac, mediastinal, and mesenteric glands. In several cases of syphilitic disease of the liver the same author has observed enlargement of the lumbar, iliac, and deep inguinal groups as well as of the glands in the neighbourhood of the diseased organ. All the affected glands were swollen to four or five times their natural size, and were soft, reddish, and pigmented. On section they had a medullary appearance with no tendency to caseous degeneration, which latter character, as well as their anatomical structure, served to distinguish them from scrofulous glands. In Cornil's case of gummata of the stomach and liver, already mentioned, there was also enlargement of the glands in front of the cœliac axis as well as of those about the pancreas, pylorus, and bronchi. The glands were white, swollen and hard; on section a few drops of a puriform liquid escaped, which under the microscope, was seen to contain round lymphatic cells besides large endothelial cells which were swollen and contained one or more nuclei. In another case, that of a syphilitic infant, Cornil[5] found the bronchi surrounded by enlarged, very vascular, hardened glands, which showed no sign of caseous degeneration. Quain[6] mentions having treated several syphilitic patients in whom he diagnosed enlargement of the bronchial glands: the symptoms, which closely resembled those of phthisis, yielded to remedies directed against the specific disease.

Of the more superficial glands those of the groins are most frequently affected by tertiary syphilis. In 1871 Verneuil[7] reported

[1] Fournier : Syphilis chez la Femme, p. 630.
[2] Gowers : Reynolds' System of Medicine, vol. v. 1879, p. 311.
[3] Gonnet : Essai Clinique sur l'adenopathie Syphilitique tertiaire. Thèse de Paris. 1878.
[4] Lancereaux : Traité d'Anatomie Pathologique. 1879, tome ii., p. 525.
[5] Cornil : Loc. cit., p. 431.
[6] Quain : British Med. Journal. 1878, vol. ii., p. 863.
[7] Verneuil : Arch. Gén. de Méd. 1871, tome ii., p. 385.

the case of a man who underwent amputation of the leg for disease of the calcaneum and afterwards died. In his left groin was a large mass which Verneuil considered to be a gumma of the inguinal glands. Two other cases of gummata of the inguinal region under Verneuil's care have also been recorded by Bourdon.[1] Both these patients were women; one improved, and the other recovered under iodide of potassium. Owen[2] reports the case of a congenitally syphilitic female child aged five, who had ulceration of the palate as well as a firm, dusky, ulcerated swelling of the left groin. Under iodide of potassium the inguinal tumour disappeared and the palate healed in less than six weeks. Mauriac[3] relates three cases of inguinal gummata which came under his own observation. In one, both groins were affected symmetrically. All the patients improved rapidly under iodide of potassium. These cases are interesting from another point of view, in connection with which indeed Mauriac brings them forward, viz.:—in the diagnosis from the so-called *bubon d'emblée.* We shall notice the cases more fully in the chapter on 'Chancre.'

A case diagnosed as one of gummy adenitis of the *cervical glands* has been published by Campana:[4] A woman, who had been ten years syphilitic, had a sharply cut gummy ulcer beneath the chin. At the right side of the neck were two enlarged glands as big as walnuts; on the left side was a fluctuating swelling of about the same size, which, on being incised, discharged a little yellow fluid containing shreds of broken-down tissue. Under iodide of potassium healing took place in ten days, while the other glands became reduced in size.

[1] Bourdon: Annales de Derm. et de Syph. 1872—3, p. 95.
[2] Owen: Brit. Med. Journal. 1879, vol. i., p. 46.
[3] Mauriac: Du bubon d'emblée. Gazette des Hôpitaux. 1879, Juin, 12, 19; Juillet, 1, 31.
[4] Campana: Giorn. Ital. delle Mal. ven. e della Pelle. 1871, vol. ii., p. 97.

SYPHILIS.

CHAPTER VIII.

THE NERVOUS SYSTEM.

(Contributed by W. R. Gowers, M.D.)

The brain, spinal cord, and nerves, are frequently diseased in constitutional syphilis. The morbid processes consist of (1) syphilitic growths and disease of arteries, similar to the growths and arterial disease which occur elsewhere. (2) Inflammation, subacute and chronic, often attended with a considerable formation of new tissue, affecting commonly the meninges, occasionally the interstitial tissue of the nerve centres and nerves. (3) Certain chronic degenerations sometimes follow syphilis in a manner which suggests that they are due to it.

The occurrence of nervous affections in the subjects of syphilis was noticed as long ago as the sixteenth century, but was either regarded as the consequence of syphilitic bone disease,[1] or was ascribed to the effects of drugs given for the cure of syphilis,[2] an opinion which is even yet not entirely extinct. A syphilitic tumour of the brain was, however, described by Baillou[3] in the beginning of the seventeenth century, and most subsequent writers on syphilis alluded to the brain as a part liable to be attacked by the disease, but only in general terms. Hunter threw doubt on the occurrence of true syphilitic affections of the brain, but in the early part of the present century many isolated examples of such disease were published. It is only during the last forty years, and especially during the second half of this period, that the subject has attracted general attention, and the occurrence of varied forms of syphilitic disease of the brain, spinal cord, and nerves, has been demonstrated, and universally admitted. A series of cases of sudden hemiplegia, due

[1] Botalli: Luis Venereæ curandi ratio. 1563.
[2] Ulrich von Hutten: De morbi gallici curatione. 1519, Cap. III.
[3] Ballonius: Paradigmata, Opera omnia, vol. ii., p. 525.

to syphilis, was recorded by Budd[1] in 1842, and was followed by the publication of many isolated cases. The delineations of Ricord[2] in 1851, and the pathological study of the subject by Virchow[3] in 1858, with the writings of Gros and Lancereaux[4] in 1861, of Zambaco[5] in 1862, and of Wilks,[6] and Wagner[7] in 1863, heralded a large number of contributions to our knowledge of this class of diseases. Of these the most important are those of Reade,[8] Moxon,[9] Buzzard,[10] Hughlings Jackson,[11] and Broadbent,[12] in this country; of Lancereaux[13] and Fournier[14] in France, of Virchow,[15] Wunderlich,[16] and Heubner[17] in Germany, and of Keyes,[18] in America.

General Etiology.—The period of constitutional syphilis at which the nervous system suffers, varies much. Some forms of disease have been observed as early as the third month after infection, but it is rare for the nervous system to suffer during the first year. Most cases occur between the third and the tenth year, although instances are met with later, as fifteen, twenty, and twenty-five years after infection. Many cases, recorded as examples of very early or very late disease, are open to doubt. In some cases in which the nervous symptoms followed soon after the primary sore, a previous infection could not be satisfactorily excluded. In some of the very late cases, not verified by autopsy, the patients had reached the degenerative period of life, when other potent causes of disease are active, and to these the symptoms may have been due.

Certain forms of syphilitic disease of the nervous system occur earlier than others. Meningitis may occur, for instance, within six or eight months of infection, while arterial disease and growths are almost unknown until after the first year. But each form of disease may occur at a very late period, even twenty years after the primary sore. The degenerative nervous diseases associated with syphilis,

[1] Budd : Lond. Med. Gazette, vol. xxx. May, 1842, p. 357.
[2] Ricord : Clinique Iconographique, 1851.
[3] Virchow : Archiv für Path. Anat., Bd. xv. 1858.
[4] Gros et Lancereaux : Des Affections Nerveuses Syphilitiques. Paris, 1861.
[5] Zambaco : Des Affections Nerveuses Syphilitiques. Paris, 1862.
[6] Wilks : Guy's Hosp. Rep. 1863, p. 1.
[7] Wagner : Archiv der Heilkunde, Bd. iv. 1863, p. 161.
[8] Reade : Dublin Quart. Journ. 1863, p. 324.
[9] Moxon : Guy's Hosp. Reports. 1867.
[10] Buzzard : Clinical aspects of Syphilitic Nervous Diseases. London, 1874.
[11] Hughlings Jackson : In many scattered papers, and especially in Journal of Mental Science, vol. xx. 517, xxi., 207 ; and Lancet. 1880, i., p. 275.
[12] Broadbent : Lettsomian Lectures, Lancet. 1874, vol. i., pp. 43, 115, 187, 255.
[13] Lancereaux : Traité historique et pratique de la Syphilis. Paris, 1866 and 1873.
[14] Fournier : La Syphilis du Cerveau. Paris, 1879.
[15] Virchow : Krankhaften Geschwülste, Bd. ii. 1864—65.
[16] Wunderlich : Volkmann's Klin. Vorträge, No. 93. 1874.
[17] Heubner : Arch. der Heilkunde, Bd. xi. 1870, p. 273 ; and Ziemssen's Cyclopædia of Pract. Med., American Trans., vol. xii. 1877, p. 293.
[18] Keyes : New York Med. Journal. Nov. 1870.

occur, as a rule, at a very late period, most of them more than ten years after infection.

Other causes, which act directly upon the nervous system, apparently sometimes aid in determining the occurrence of the local affection. They are to be recognised more frequently in diseases of the brain than in those of the spinal cord or nerves. *Hereditary predisposition* to nervous affections has occasionally been noted. It appears to influence especially the occurrence of the degenerative diseases, although some writers (as Heubner) are inclined to ascribe to it an influence in the production of the other forms. The writer has seen one or two cases which seemed to point in the same direction, but it is probable that such cases have little significance, when taken in connection with the great majority of examples of cerebral syphilis, in which no such predisposition can be traced. *Traumatic influences*, blows and falls on the head, seem in some cases, to have distinctly determined the local affection. The tissue-change of repair may assume a special character under the influence of syphilis, and become a syphilitic process. *Psychical causes*, anxiety, mental overwork, &c., have been supposed to exert an influence, and some writers have even gone so far as to connect with this a special proneness of head-workers to suffer from cerebral syphilis. It is, however, not clear that this class suffers with especial frequency. A large proportion of the cases come from the labouring classes. It must be remembered, also, in estimating the influence of psychical causes, that all depressing influences tend to favour the action of any latent morbid tendency. The effect of this class of causes may most frequently be traced in the production of the degenerative diseases.

In describing the syphilitic diseases of the nervous system, it will be convenient to consider successively the pathology and symptoms of the organic diseases of the brain which result from acquired syphilis; those disorders which are not to be traced with certainty to actual organic disease; syphilitic disease of the spinal cord, and of the nerves, and lastly the diseases which result from inherited syphilis.

The Brain.—The most common forms of brain disease due to syphilis, consist in the occurrence of growths, of arterial disease, and meningitis.

Syphilitic growths may form, as 'nodes,' on the inner surface of the cranial bones, and may damage the brain, or cranial nerves, by pressure. Distinct tumours, 'syphilomata' or 'gummata,' form on and in connection with the membranes, dura mater or pia mater, not only where they invest the brain, but in the sheaths which they furnish to the nerves.

The growths resemble in their anatomical characters, those which occur in other organs in constitutional syphilis. They are rounded, or nodular, vary in size from a split pea, or less, to that of a hen's egg. The recent portions are greyish-red, translucent, and rather soft. A characteristic feature is the tendency to degeneration,—induration, and especially to caseation. The latter usually begins at many points, so that a syphiloma of some size presents irregular coalescing spots and areas of a yellow opaque aspect, surrounded by the soft grey translucent tissue, and separated by firmer fibroid tracts. The nerve tissue is damaged by pressure, or by direct invasion. Around the tumour it is usually more or less softened, but it may be normal in consistence, and even in rare cases, unduly firm. In microscopical structure, the growths consist, in the early stage, of round cells, embedded in a very delicate stroma. Subsequently, cells, apparently fusiform in shape, arise between the round cells, so that the structure comes to resemble closely that of granulation tissue. The fusiform cells have no regular arrangement. The process of invasion of nerve tissue, is often by extension along the walls of vessels. A section, for instance, shows processes extending from the tumour into the cerebral tissue; each process gradually becomes narrower, and from its extremity, an unobliterated vessel may be traced.[1] The growth thus evidently extends along the perivascular canals, and the processes widen laterally until they coalesce. Within the tumour blood-vessels appear to be obliterated by an invasion of the outer coat by new growth, and a cell-production in the inner coat, thickening it, and gradually filling up the lumen of the vessels. This process of obstruction of vessels is probably the cause of the characteristic tendency to caseation which these growths present.[2] These caseous portions consist of the products of fatty degeneration of the tumour-cells. The firm fibroid tracts contain a few round cells, and consist chiefly of fusiform cells and fibres. Old gummata may have undergone the process of caseation throughout. Ultimately the products of degeneration may be removed, the fibres shrink, and there results a mere fibrous cicatrix to mark the position which the syphiloma previously occupied.

The growths, when commencing in the dura mater, may arise between its two layers and form firm tumours, containing more fibrous tissue than those which begin in the pia mater, and they often undergo early degeneration. They may push the pia mater before them, damaging the brain by pressure only, or may extend through the pia mater and invade the brain by direct growth. A syphiloma of the outer surface of the bone has been observed to

[1] ...e Figure, Path. Trans., vol. xxviii., Plate XIV., Fig. 10.
[2] Greenfield: Path. Trans., vol. xxviii., p. 377.

coincide in position with a similar growth on the dura mater within.[1]

Syphilomata spring from the pia mater or arachnoid tissue more frequently than from the dura mater. They may commence in any part, may develope on the surface, or from a fold of pia mater between two convolutions, or from a process of the pia mater extending into a lateral or fourth ventricle. When on the convex surface of the brain, they commonly invade the dura mater as well as the cerebral substance. When they grow at the base of the brain, the dura mater is less commonly invaded. Adjacent to the growth, the membranes, at the base of the brain especially, are more or less thickened by a process which has the characters both of a chronic inflammation and a diffuse growth. The various structures become thus matted together by indurated tissue.

As already stated, it is very doubtful whether gummata ever arise in the cerebral substance. This has been pointed out by Wilks[2] and Heubner,[3] and with this opinion, the observation of the writer entirely agrees. Every growth apparently isolated in the substance of the brain has been ultimately found to be connected with a fold of pia mater or with a surface tumour. For instance, in one case, on cutting across the optic thalamus, a growth was found in the lower part, apparently isolated; a second growth was situated at the surface of the pons, near the upper border. Careful examination revealed an isthmus of growth, connecting the two. The history of the case made it certain that the surface growth had preceded that in the thalamus, and that from it the latter had sprung. Gummata are most frequent between the fifth year and the twelfth year of the disease. They have, however, been observed as early as twelve months, and as late as fifteen years after infection.

Disease of the Arteries.—The arterial disease of the cerebral vessels is similar in character to that which occurs elsewhere, and is described in Chapter VII. As an isolated change, *i.e.*, apart from adjacent growths, it is almost confined to the larger cerebral vessels; the intracranial part of the carotid, the middle cerebral, the vertebrals, basilar, and posterior cerebrals are the arteries most commonly diseased. One or more than one artery are found to be diseased with equal frequency. The affection is usually irregular in distribution, but occasionally arteries of opposite sides are symmetrically affected.

The nodular swellings on the vessels are not usually large enough

[1] Greenfield: Path. Trans., xxviii., 262.
[2] Wilks and Moxon: Path. Anatomy. 1875, p. 237.
[3] Heubner: Loc. cit., p. 308.

to cause symptoms by pressure on adjacent structures. Their chief effects are due to the diminution of the calibre of the artery on which they form. By this, the blood supply through the vessel is lessened, or even arrested. The final arrest is usually due to the sudden formation of a clot in the narrowed part, often during a temporary retardation of the blood current. From the mere narrowing of the channel, partial local anæmia of the brain results, and the occlusion of the vessel causes necrotic softening, except in the rare cases in which adequate anastomoses permit a collateral circulation to be established. The softening resembles precisely that from other forms of vascular obstruction, such as embolism, and thrombosis from atheroma. Its most frequent seat is the corpus striatum, from the frequency with which the carotid and middle cerebral arteries are diseased. It occasionally occupies the optic thalamus and posterior part of the lenticular nucleus of the corpus striatum in cases of disease of the posterior cerebral artery. Disease of the basilar artery occasionally causes death without producing softening; the parts supplied by it are so essential for the maintenance of life, that the sudden anæmia causes rapid death before actual softening can occur. In some cases, syphilitic disease of an artery may cause anæmia and softening with serious interference with the function of the nerve tissues, and even death, without occluding the calibre of the artery, by the thickening of the wall closing the branches which are given off by the diseased vessel. This sometimes occurs, for instance, in disease of the basilar artery, by which the transverse arteries of the pons are readily occluded, and, as the writer has seen, death may occur with symptoms of anæmia of the pons and medulla, although the calibre of the basilar is but little narrowed.

Syphilitic disease of the wall of a cerebral artery may lead to the formation of an aneurism. In the subjects of constitutional syphilis such aneurisms have been found unruptured, and they have been found ruptured, with resulting extravasation. In a young woman under the writer's care, the subject of constitutional syphilis, death resulted from the rupture of an aneurism of the left posterior cerebral artery. Lancereaux[1] found unruptured aneurisms, the size of peas, on the middle cerebral; aneurisms of the basilar and one middle cerebral were found in a syphilitic patient by Russell.[2] The most remarkable case of the kind is that which has been described by Chvostek and Weichselbaum, mentioned in Chapter VII. Blachez[3] met with meningeal hæmorrhage in a case of constitutional syphilis,

[1] Lancereaux: Traité de la Syphilis, 1873, p. 308.
[2] Russell: Brit. Med. Journal. July 23, 1870.
[3] Blachez: Bull. de la Soc. Anatomique. 1862; quoted by Fournier: Loc. cit., p. 47.

the extravasation having resulted from rupture of the basilar artery. In other cases hæmorrhage has been found co-existing with syphilitic arterial disease, although no actual aneurisms have been discovered. In connection with inherited syphilis a case will be mentioned in which a child, the subject of the inherited disease, died from extensive cerebral hæmorrhage; the arteries presented abundant syphilitic disease, although no actual aneurism was discovered.

The period after infection at which vascular disease is met with, presents considerable variation. It occurs with nearly uniform frequency between the second and the twelfth year. Sudden hemiplegia which, as will be seen, is strong evidence of the existence of arterial disease, has been many times noted between the sixth and twelfth month after infection.[1] Actual disease of the basilar and middle cerebral arteries, associated with local meningitis, was found by Ayer in a man, aged 27, whose symptoms (mental disturbance and hallucinations) commenced six months after the primary sore.[2] Occasionally arterial disease is met with at a later period, at the fifteenth and even the twentieth year after infection.

Meningitis.—Simple meningitis may occur in the subjects of constitutional syphilis, by the extension of inflammation from carious bone. Acute general meningitis, without obvious exciting cause, has been met with in syphilitic patients in rare instances, but it is not at present proved that the two diseases are related. Subacute, and especially chronic meningitis, diffuse or affecting a limited area, is however a very common consequence of syphilis. In the neighbourhood of syphilitic growths, the pia mater and arachnoid tissue are often found thickened and indurated, the adjacent parts being matted together. A similar change is occasionally met with, sometimes widely-spread, apart from any syphilomatous growth. It may occur at the base of the brain, or upon the convexity. In the early stages, the membranes may present a soft semi-opaque or gelatinous thickening, sometimes with pus-like 'deposits.' Under the microscope pus corpuscles may be found, together with round and spindle cells, similar to those which compose syphilitic growths. The subjacent cerebral tissue may be damaged by softening or by induration, apparently in consequence of the extension to it of inflammation similar to that of the meninges. Nerves passing through the inflamed tissue are damaged by the extension to them of the inflammation, or by pressure—by the latter especially during the stage of induration and contraction of the newly-formed tissue elements.

The dura mater may be the seat of a syphilitic inflammation

[1] Mansserow: Die tertiäre Syphilis. Wien, 1877, p. 130. Keyes: Loc. cit., Case 1. Mauriac: Sur les affections syphilitiques précoces des centres nerveux, Cases 4 and 7.
[2] Ayer: Boston Med. and Surg. Journal. Sept. 19, 1878.

('pachymeningitis'), by which it becomes much thickened, usually on the inner surface, in a considerable area. It may become adherent to the pia mater and firmly connected with the bone. Thrombosis may occur in cerebral sinuses within the affected part, and in consequence of this, softening of the brain may occur.

The affection of the dura mater occurs especially during the later stages of constitutional syphilis. The subacute and chronic inflammation of the arachnoid and pia mater is frequently an early change, occurring even at the commencement of the secondary period, and probably before any other of the visceral affections. Several cases in which symptoms of meningitis occurred three or four months after the primary disease have been recorded by Mauriac;[1] but in at least some of these it is difficult to exclude the possibility of a previous infection. An early case, however, has been described by Dowse,[2] which seems beyond doubt. A prostitute, aged 19, died with cerebral symptoms two months after the primary disease, and during an eruption of syphilitic roseola. The membranes covering the pons and inferior vermiform process of the cerebellum were found converted into a gelatinous looking mass, and the contiguous parts of the brain tissue were slightly softened.

Inflammation of the Brain.—It was thought by some of the earlier observers that local inflammation might result from syphilis, but it is probable that in most cases the supposed inflammatory softening was really dependent upon the occlusion of vessels by syphilitic disease of their walls. In the neighbourhood of gummata, as of simple growths, inflammatory softening may occur. A condition of local vascularity, with infiltration by a greyish material, was found by Sutton and Turner[3] in a case of constitutional syphilis with gummata in the brain, but it is not clear, from their description, that this change was independent of adjacent actual growths.

One observation has been recorded by Barthélemy[4] which suggests that disseminated foci of cerebritis may occur from syphilis. Although the case stands alone, it is important, because, as will be seen, there is reason to believe that a similar disseminated inflammation of the spinal cord may be of syphilitic origin.

A woman, aged 27, had been under treatment for three months, on account of secondary syphilis (mucous tubercles and a disseminated papular syphilide of the whole surface of the body). She then complained of headache, followed by hebetude, somnolence, and noises in the ears, followed by vomiting and low

[1] Mauriac: Loc. cit., p. 5.
[2] Dowse: Syphilis of the Brain and Spinal Cord. 1879, p. 98.
[3] Sutton and Turner: Path. Trans., vol. xxviii., p. 303.
[4] Barthélemy: Bull. de la Société Anatomique. Meeting of April 6th, 1877.

delirium. The somnolence and headache increased, and three weeks later, there was left-sided weakness, without affection of sensibility. She passed into a state of coma, and died a month after the onset of the symptoms. The meninges and arteries of the base were found to be perfectly healthy, and the convolutions were normal. Sections of the fronto-parietal regions of each hemisphere showed islets of 'encephalitis,' the size of lentil seeds, scattered irregularly through the white substance of the centrum ovale. The grey substance of the hemispheres was everywhere normal.

Sclerosis of the Brain.—In a few cases, sclerosis of the brain has been met with in the subjects of constitutional syphilis. Eccheverria,[1] for instance, found, co-existing with syphilitic arterial disease, and aneurism of the right middle cerebral artery, "typical sclerosis of the left optic thalamus, and exuberant growth of connective tissue elements." The writer once found, in the brain of a syphilitic subject, areas of induration, without change of colour, in the white substance of the hemispheres. Disseminated (insular) sclerosis of the brain and cord, was met with by Charcot and Gombault[2] in a case of old syphilis. Lastly, in a man who had suffered many years before his death from both primary and secondary symptoms, the writer found a condition of true miliary sclerosis of the cerebral convolutions. The change was confined to the junction of the grey and white substance and to the lenticular nucleus, and it consisted of minute spots of grey degeneration, which had partially coalesced, festooning the sections of the convolutions.

The cranial nerves are often damaged by growth and chronic meningitis, by pressure, or involvement in inflammation. When arterial disease exists alone they commonly escape. Small syphilomata may form upon their sheaths, and are sometimes symmetrical, the nerves of opposite sides being similarly affected. The most common cause of damage, however, is by thickening and induration of the membranes through which they pass. These changes will be more fully described in the section on diseases of the nerves; they are here mentioned in order to render more intelligible the symptoms of organic brain disease.

Symptoms.—The pronounced symptoms which result from the forms of organic brain disease already described, meningitis, vascular disease, and growth, are often preceded by slighter, less definite symptoms which have been termed *premonitory*, and are more common and more marked in meningitis and tumour than in vascular disease. Of these early symptoms pain in the head is the most constant. It is often severe, and may be very acute, or merely a dull, heavy pain, or sense of pressure. It is frequently paroxysmal,

[1] Eccheverria: Journal of Mental Science. July, 1880, p. 172.
[2] Charcot and Gombault: Archives de Physiologie. 1873, p. 143.

and often, but not always, worse at night, like other syphilitic pains. Other early symptoms are transient attacks of giddiness, of mental dulness or of delirium. The latter may accompany the more severe attacks of pain. Occasionally transient pareses of limbs or of cranial nerves, soon passing away, may precede grave symptoms. Insomnia is often troublesome.

The *developed* symptoms vary according to the seat and character of the lesion. As they come on, the preceding pain and mental disturbance usually increase in severity in cases of tumour and meningitis, while, in arterial disease, pain often ceases on the occurrence of symptoms due to thrombosis within the vessel.

Of these developed symptoms *paralysis* is one of the most frequent and important. Its distribution and degree depend on the seat and extent of lesion, while the mode of onset, and concomitants of the palsy, indicate the nature of the lesion. In distribution it is usually hemiplegic, affecting one half of the body in the usual manner. When very local, and especially when situated in the highly differentiated regions of the cortex, the effect may be limited to one limb, arm or leg. Both sides may be involved when the disease is so situated (as in the pons) as to damage both motor tracts, or when, as often happens, there is disease in each hemisphere of the brain. Sensation may be affected, as well as motion, and the paralysis may involve the special senses (*e.g.* as hemiopia), as well as the common and tactile sensation of the trunk and limbs. Cranial nerves may be paralysed by the lesion which causes the other symptoms, or as an effect of other syphilitic mischief, and their independent affection (showing multiple lesions) constitutes strong evidence of the syphilitic nature of the mischief. An illustration of this is afforded by the case described on p. 219.

While the distribution of paralysis depends on the seat of the disease, the mode of onset depends on the nature of the lesion. As a rule to which there are few exceptions, actual growths and chronic meningitis cause paralysis of gradual onset; while in syphilitic disease of vessels the paralysis is of sudden onset. The two former produce their effects by pressure or by slow invasion of the brain: the latter leads to thrombosis in the diseased vessel, suddenly cutting off the blood supply and therefore arresting the function of a region of the brain. The rare exceptions to the rule of gradual onset in tumours and meningitis are probably due to a sudden irritative inhibition of function[1] or to thrombosis in a vessel which is compressed (as a sinus, in pachymeningitis of the dura mater). The exceptions to the rule of sudden paralysis from vascular disease depend

[1] See, On sudden Paralysis from Cerebral Tumour, "Brain," vol. i., Pl. I., p. 48.

on the change in the wall obliterating small branches, one after another, as already described, or on the calibre being gradually closed by the thickening of the wall without the occurrence of a sudden thrombosis. The exception is, however, rare.

Convulsions constitute another most important symptom of syphilitic brain disease. They are commonly due to growths or meningitis, very rarely to arterial disease. Their frequency depends on the fact that meningitis always, and gummata often, affect the surface of the brain, and frequently that part of the surface in which the cortical motor centres are situated. They sometimes result from disease at a distance from the motor centres. In many of these cases these centres may be irritated by meningitis extending from the growth: in other cases the mechanism is not clear. An illustration of the dependence of convulsions on disease away from the motor centres was afforded by a man under the writer's care who died from convulsions of extreme severity, he having previously suffered from headache, slight fits and optic neuritis. The headache ceased, and the optic neuritis subsided, and the fits ceased for a time under anti-syphilitic treatment, but the convulsions recurred and he died apparently from the violence of the fits. The only lesion in the brain was an old atrophied gumma on the anterior extremity of the right orbital lobule.

The convulsions do not differ in character from those due to any other local disease, such as a simple tumour. They differ from the ordinary convulsions of epilepsy, especially when the motor zone of the cortex is diseased, in the deliberate onset of at least some of the attacks; in consciousness being lost late, and in the patient being aware of the local onset of the convulsion in the face, hand or foot. In other cases, probably when the sensory rather than the motor region is diseased, a sensory aura, often involving the special senses, may herald the fit. An example was afforded by a patient whose fits always began with a flash of light before the left eye, after which objects looked small. The disease was a tumour behind the right angular convolution (visual centre).[1] In the slighter attacks, consciousness may be preserved throughout. Such slight attacks may be confined to the limb in which they commence, or may extend to the other parts on the same side of the body, the limbs of the other side remaining free. Most patients have at times more severe attacks in which the spasm involves the second side very quickly, even simultaneously. In these attacks consciousness may be lost so early that the patient is unaware of the onset. Occasionally the attacks are only of the latter severe character. The tongue may be bitten and the seizure be followed by sleep, as in an ordinary epileptic

[1] Reported in the *Lancet*, 1879, vol. i., p. 363.

fit. After the attack the limb in which the seizure commenced may be weak, or if, as is often the case, loss of power existed before, it may be greater after each attack. The following case presents a good example of the convulsive attacks of most characteristic form. The lesion was, without doubt, a syphilitic tumour, probably situated on the surface of the left hemisphere, opposite the middle of the fissure of Rolando.

Susan S., 37, married. A history was obtained of nodes on the forehead, and of loss of hair, a year and a half before being seen. Three months after the nodes she had a convulsive attack, limited to the right-side, and then similar attacks had recurred about once a month, and the right arm had gradually become weak and painful. She was an intelligent woman, but made occasional mistakes in words, *e.g.*, when intending to say "shall I take off my bonnet," she said "shall I take off my woke." Paralysis of the right arm was almost complete, and the limb was slightly wasted. There was no loss of sensation, and no paralysis of the tongue, face, and only trifling weakness of the leg. There was well marked double optic neuritis, without affection of sight. All the convulsive attacks commenced by a sensation in the right hand, and the convulsion was limited to the right side, consciousness however being lost. Occasionally she would have sensations in the hand, as if a fit were coming on, and this 'aura' occasionally passed up to the shoulder without a fit, but usually ceased if the hand were bathed in vinegar and water. Voluntary or passive movements of the arm, and even allowing it to hang down, would bring on an attack. Under treatment (iodide, mercury and galvanism), the arm gradually regained power, the fits ceased, and the optic neuritis subsided. After she left the hospital, however, although the arm became quite strong, the fits recurred and continued, still confined to the right side, although various forms of treatment were employed.

This case affords an example of the fact that the removal of a syphilitic growth by treatment does not always arrest the fits which it has caused. The irritative damage to the nerve-tissue which was the immediate cause of the convulsions, may persist as impaired nutrition, causing convulsive action, although the syphilitic disease is removed. Of this the case mentioned on p. 214 is another illustration.

Although the convulsions are commonly local in their commencement, they may be throughout general, and resemble closely an attack of ordinary epilepsy. They are, however, rarely preceded by 'epigastric aura,' so common in idiopathic epilepsy. The attacks of *petit mal*, also, instead of consisting in a local sensation or spasm, may be characterised by momentary loss of consciousness, giddiness, or transient loss of sight, similar in character to those of ordinary epilepsy.

Mental disturbance is occasionally met with. Active delirium is rare: hebetude and a low half-demented condition, with occasional paroxysms of obvious derangement, are more frequent. Defective emotional control is very common in all forms of syphilitic brain

disease, in both sexes, and may persist long after active symptoms are over. More pronounced psychical derangement chiefly occurs in cases of chronic meningitis.

Optic neuritis is exceedingly common in cases of syphilitic disease of the brain; but is almost confined to cases of tumour or of long-continued chronic meningitis. The great majority of cases of syphilitic brain disease with optic neuritis are cases of growth. It is, as a rule, absent when only the vessels are diseased. Optic neuritis co-existing with vascular disease has usually an independent cause. For instance, in the case of vascular disease in inherited syphilis, already mentioned, optic neuritis also existed; but, post mortem, there was also found great thickening of the orbital plates of the frontal bones, and narrowing of the optic foramen, to which, and not to the vascular disease, the neuritis was probably due.

Neuritis thus commonly co-exists with the symptoms of syphilitic growth, viz., headache, convulsions, and paralysis of gradual onset. It is always secondary in point of time to the cerebral growth, but if this is in a position in which symptoms are not readily produced, the intra-ocular change may be the first symptom which attracts attention. Its characters present nothing distinctive; the swelling of the papilla, obscuration of the edges of the disc, disturbance of vessels and extravasations of blood, are the same as those seen in other intracranial diseases.

Symptoms of special lesions.—The symptoms produced by each of these forms of syphilitic disease may be briefly enumerated.

Meningitis.—The most frequent symptoms are headache, often marked by nocturnal exacerbations; sleeplessness; mental change, excitement passing on to dementia; convulsions; peripheral pains, hyperæsthesia, and paralysis in the regions supplied by the cranial nerves, paralysis of the limbs; coma. Moderate elevation of temperature is usually, though not always, present. Optic neuritis is a frequent symptom; it occurs early when the disease is at the base of the brain, at a later period when the convexity is affected. Mental disturbance is especially marked when a large area of the meninges is involved. On the other hand, if the inflammation is limited in extent, the symptoms are often more local in character. For instance, in a case recorded by Dreschfeld,[1] chronic syphilitic meningitis over the right ascending parietal convolution was evidenced only by convulsions confined to the left hand and arm, and left side of the face. In such cases of local meningitis the symptoms may be the same as those of tumour.

[1] Dreschfeld: Lancet. Feb. 24, 1877. A very similar case has been published by Leloir: Gaz. Hebd. Jan. 3, 1879.

Arterial Disease.—The characteristic symptom of syphilitic disease of the cerebral arteries is sudden hemiplegia, the result of the occlusion of the vessel. 'Premonitory' symptoms are present in about half the cases, for a few days or weeks before the onset of the hemiplegia. Of these headache is the most frequent. Sleeplessness, giddiness, transient attacks of unconsciousness, mental change, are also occasionally noted. In some cases these symptoms are due to associated meningeal disease. Less frequently, heaviness, tingling, &c., in the limbs subsequently paralysed, precede the onset; in one recorded case for as long a period as eight days.[1] Such sensations are more commonly the immediate precursors of an attack. For instance, a man two and a half years after infection, suffered for six weeks from headache; and then felt transient weakness and tingling in the left hand and arm, which returned five times during the day, and the last time he fell unconscious; on recovering, he found himself paralysed on the left side. These transient symptoms are no doubt due to the hindered supply of blood causing partial cerebral anæmia before the actual occlusion of the vessel occurs.

The onset of the hemiplegia is attended with transient loss of consciousness in one third of the cases; in the remainder there is no loss of consciousness and merely slight giddiness. The paralysis resembles ordinary hemiplegia in its characters. It is somewhat more frequent on the left than on the right side: when on the right side it may be accompanied with aphasia. When the pons is affected, the paralysis may be bilateral or unilateral, and there may be paralysis of the cranial nerves on the opposite side to that of the limbs. When the vessel occluded is small and unimportant the paralysis may be of transient duration, passing away in the course of a few hours or days. More commonly it persists for a longer time, and sometimes is permanent. Occasionally the patient passes into a condition of coma and dies in a few days. This is in consequence of a large vessel, the carotid or basilar being diseased. Quick recovery from one attack has been followed by a second, evidently from extension of thrombus from a small into a larger vessel. The paralysis if persistent may be attended by late rigidity, and not rarely by mobile spasm, resembling athetosis.

The following case is an example of hemiplegia from occlusion.

Eliza B., æt. 25, married, came under my care at the National Hospital for the Paralysed and Epileptic, in November, 1878, on account of left hemiplegia of six months' duration. Previous to its onset she had suffered, for some months, from severe pain in the head. The onset was in the night. She went to bed well, and

[1] Mauriac: Loc. cit., Case 2, p. 14.

woke up in the morning hemiplegic. The arm and the leg were at first completely paralysed, but after some months the leg slowly recovered power. When seen, the arm was still powerless, but the leg had regained sufficient power to enable her to walk a few yards. There was slight paralysis of the lower part of the face, on the left side; no deviation of the tongue, and no hemiopia, and no ophthalmoscopic change. Sensation in the paralysed limbs was normal. There was well marked ankle-clonus on the left side. There was no cardiac murmur. No history of venereal disease was obtained, but she had had a child before her marriage, and some suspicious coppery-red spots were found on the legs.

The case was diagnosed as softening in the right cerebral hemisphere, due to syphilitic disease of the middle cerebral artery, and attended with descending degeneration of the left side of the spinal cord. She was treated with iodide of potassium and mercury, but, a month later, presented no improvement. She was not seen again for six months; then, the left hemiplegia remained nearly the same, but there was some recent weakness of the right leg with well-marked ankle-clonus. The right arm was unaffected. A fortnight afterwards the right leg became rapidly weaker: severe headache and delirium came on. She was admitted into the Hospital and died a week later. Post mortem, the right middle cerebral artery was found to be occluded near its entrance into the fissure of Sylvius. Its wall was thickened and opaque, evidently from old syphilitic disease. A large area of softening involved the greater part of the corpus striatum. No other syphilitic disease was found in the brain, nor was there any visible change to account for the delirium. The whole of the dorsal region of the spinal cord was found to be affected with chronic disseminated myelitis, causing spots of ill-defined grey degeneration. On microscopical examination, this was seen to occupy chiefly the peripheral layers of the white columns. The left lateral column was sclerosed throughout the cord (descending degeneration from the cerebral lesion), and there was also sclerosis of the right lateral column in the dorsal and lumbar regions.

Frequently the hemiplegia is quickly succeeded by general mental disturbance; a sleepy, apathetic state, sometimes with dreamy delirium. There is usually a confused sense of what is going on, and the patient expresses his ideas with some difficulty. It is apparently the result of widely spread arterial disease, interfering with the blood supply to many parts of the brain.[1] When the disease is confined to a single artery, this mental state may be absent, as in the case just described.

Affections of cranial nerves and optic neuritis do not accompany simple syphilitic arterial disease. The former is usually due to coincident meningitis: the latter to meningitis, but more especially to growth.

Growths.—The symptoms produced by syphilitic growths do not differ, in themselves, from those which are due to other non-syphilitic tumours. Of these, headache and optic neuritis are the most frequent. The pain in the head is variable in seat, and often very intense, with nocturnal exacerbations. It invariably precedes other symptoms. The optic neuritis presents nothing specific in its

[1] Heubner: Die luetische Erkrankung der Hirnarterien. 1874, p. 219.

characters. In syphilitic growths, convulsions are especially common, in consequence of the frequency with which the disease is on the surface of the brain. Paralysis, of gradual onset, and psychical disturbance, excitement or depression, are common, and depend on the position of the growths. The latter symptom is sometimes the result of associated meningitis, which occurs more frequently than in the case of simple tumours. Frequently syphilitic growths are multiple, or are associated with other forms of syphilitic intracranial disease; hence there are often symptoms indicating multiple lesions of the brain.

The following case of syphilitic tumour of the brain is particularly instructive; it is an example of the diffuse thickening of the meninges which often accompanies a localised growth, of the multiple paralyses of cranial nerves which is a characteristic symptom, of the occurrence of syphilitic growths in the spinal cord, and of the progress of the symptoms in spite of treatment, which is occasionally observed in inveterate cases.[1] It also illustrates the fact that the diagnosis has sometimes to be made without any history, direct or indirect, of syphilis.

A man, aged 45, came under the writer's care at University College Hospital in 1875. There was no history of primary sore or secondary symptoms. He had been married twelve years. He had had two attacks of gonorrhœa twenty and twenty-five years previously. He came to the Hospital on account of severe attacks of pain in the left side of the head and face, in the region supplied by the fifth nerve. It was found that there was hyperæsthesia in this region: paralysis of the muscles supplied by the motor root of the left fifth nerve, and weakness of the left external rectus. There was no weakness of the limbs. Iodide of potassium was given, and the paralysis of the external rectus disappeared. The hyperæsthesia in the parts supplied by the fifth gave place to anæsthesia: the paralysis of the muscles of mastication continued. One day he appeared with a general anterior inflammation of the left eyeball, involving cornea, iris, and sclerotic. An abrasion was found in the centre of the cornea, and while under examination he passed his finger across the cornea, without being aware that he had touched the eye. The inflammation was very obstinate, lasting several months. The pain became much slighter, and he ceased to attend. In June, 1876, he again came with complete paralysis of the left internal rectus, and although iodide and mercury were given, this paralysis continued without abatement. In November the muscles supplied by the left third nerve became weak, and he complained of tingling in the right arm. Some failure of mental power came on, and he was admitted into the Hospital at the end of November.

He then complained of constant dull headache. Articulation was indistinct. He talked in an excited manner, and had little control over the display of his emotions. The sight of the left eye was somewhat dim, but no defect in the field of vision could be found in the right eye, although the patient's mental state rendered this somewhat uncertain. The paralysis of the left third nerve became complete, and the fourth nerve was also paralysed; so that the left eye was motionless,

[1] The case is described in greater detail in the Path. Trans., vol. xxviii., p. 281.

except for slight movement outwards by the external rectus, which had recovered a little power. There was some deafness of the left ear, and slight weakness of the right side of the tongue. There was weakness, slight rigidity and diminished sensibility of the right arm and leg, and slighter weakness of the left limbs. The paralysis and rigidity of the right arm increased during the next few weeks, his mental state became duller ; and stools were passed involuntarily into the bed. By the beginning of January, 1877, the right arm was powerless, and then the left arm and leg gradually became completely paralysed, and the muscles of both arms rapidly wasted. He died on January 25th. Whilst in the Hospital he had forty-five grains of iodide of potassium daily, and for about a month, mercury in addition.

Post-mortem examination.—Behind the optic commissure in the position of the infundibulum, was a syphilitic tumour, the size of a nut, opaque and degenerated, and softened in the centre. It had not involved the optic tracts or the cerebral peduncles. The membranes over it were vascular and much thickened with yellowish material, and this diffuse meningeal change extended into the right fissure of Sylvius, and backwards on to the pons. The left posterior cerebral artery, the left third, fifth, and sixth nerves were all embedded in indurated tissue which united the dura mater inseparably to the anterior portion of the pons and also to the adjacent part of the temporo-sphenoidal lobe. Beneath this induration a growth extended for a quarter of an inch into the substance of the pons on the left side. The left Gasserian ganglion was involved in the thickened tissue. The left posterior cerebral artery was greatly thickened, and uniformly dilated, so as almost to constitute an aneurism. Its channel was free. In the posterior and under part of the left optic thalamus, and involving the posterior part of the internal capsule, was a mass, the size of half a walnut. Its section showed the mingling of greyish-red translucent tissue, and scattered, irregular areas of caseation, which is characteristic of a syphilitic gumma. From the posterior part of this tumour, a narrow isthmus of growth extended along the crus to the growth on the surface of the pons, already described.

In the lower part of the cervical enlargement of the spinal cord, the dura mater was adherent for about an inch, and at that spot a syphiloma was found in the left half. It had apparently commenced in the neighbourhood of the posterior cornu, but at its largest part, its size was half that of the normal cord, and the nerve tissue was reduced to a crescent around the growth. In the middle of the cervical enlargement there was another small growth in the right posterior column.[1] The structure of these growths was that of syphiloma.

In the kidneys were several indurated spots beneath the capsule, which was puckered over them. They had very much the appearance of cicatrices left by syphilitic growths. One testicle was extremely small, and was occupied by a firm nodule, containing many points of caseation.

No doubt the disease began on the surface of the pons, in the neighbourhood of the fifth nerve, and to this affection all the early symptoms were due. Apparently the growth had extended from this along the crus, to the neighbourhood of the optic thalamus, and had there given rise to the right-sided weakness and loss of sensation, by the damage to the fibres of the internal capsule. The weakness in the left limbs, and the wasting in the arms, were apparently due to the tumours in the cervical region of the spinal cord.

Syphilitic Epilepsy.—Attacks of epileptiform convulsion constitute an important symptom of two of the forms of brain disease just described, viz. syphilitic meningitis and growths. These con-

[1] Figured in "Diagnosis of Diseases of the Spinal Cord." 1880. Plate, Fig. 6.

vulsions may have the deliberate march, and the limited range, characteristic of those due to local brain disease; or they may, in their general distribution, rapid evolution, and early loss of consciousness, closely resemble those of idiopathic epilepsy. They are distinguished—(1) by the age of the patient. They usually commence after twenty-five years of age, and therefore at a period of life at which epilepsy less commonly begins; (2) by the persistent headache which commonly precedes their occurrence, and exists during the whole of the intervals between and not merely after the attacks; (3) by the frequent association of optic neuritis; (4) by the coincidence of paralytic symptoms; and (5) by the association of early and often progressive mental disturbance.

Convulsions due to syphilitic brain disease may cease when the latter is removed or lessened by treatment. Or they may persist, recurring from time to time, without any evidence that the original disease is still active. The 'convulsive habit' of the nerve tissues, set up by the syphilitic disease, is not, in itself, specific, and may persist, just as does the softening which results from thrombosis in a syphilitic artery. In such cases, if the convulsions are of general distribution, we have only the early history to guide us as to their nature.

Chronic meningitis is probably the most frequent cause of convulsions of syphilitic origin, and since meningitis is frequently one of the earliest of the effects of syphilis on the nervous system, it is not surprising to find that convulsions often occur at an early date. Thus of 118 cases analysed by Eccheverria,[1] no less than twenty-four occurred within a year after infection, and half the cases before the end of the second year. The sex of the patient has an influence on the period at which the disease appears. In the cases commencing within two years of infection, females were more numerous than males, while the proportions are reversed in the cases which commenced after two years, and the preponderance of males increases with the interval after infection. Eccheverria found also that in many of the males under two years, the action of other causes could be traced, as inherited neuropathic disposition, and the like, and hence he concludes that the precocity depends on the soil rather than on the seed, and that women possess a greater susceptibility than men.

Is there such a thing as idiopathic syphilitic epilepsy? That is, does syphilis cause epilepsy by an action on the nervous system, which eludes discovery by the most careful naked eye and microscopic observation? The question must be regarded as an

[1] Eccheverria: Journal of Mental Science. July, 1880.

open one, as the evidence upon it is still purely clinical and indecisive. The facts which have come under the writer's observation suggest that syphilis does not cause idiopathic epilepsy. On a careful analysis of 1450 cases from which were excluded all in which there were symptoms indicative of organic disease, the cases in which epilepsy succeeded syphilis, and no other cause, as inherited predisposition, could be traced, were so few as to be fairly explicable on the ground of accidental coincidence. Fournier,[1] however, has maintained that in the early period of constitutional syphilis, a condition of the nervous system is produced, in which 'idiopathic' diseases occur: that 'secondary epilepsy' is without actual lesion of the nerve centres, while 'tertiary epilepsy' is always due to such lesion. This view has been ably combated by Eccheverria in the paper already quoted, on the ground that, not only is meningitis commonly a secondary event, but that almost all cases of secondary convulsions do present distinct symptoms of such mischief. It must be confessed that most of the cases adduced in support of the view that epilepsy may occur without organic disease are inconclusive, on account of their imperfect observation or record. The mode of onset of the fits and the character of slighter attacks have been rarely noted, and it is chiefly by this that the convulsions from organic disease can be clinically distinguished from those of idiopathic epilepsy. In many of the recorded cases other causes of epilepsy existed, and to them rather than to the syphilis, the disease may have been due. A few cases have, however, been described, in which the attacks quickly ceased under anti-syphilitic remedies, and the cases, as far as the description allows an opinion to be formed, had the aspect of idiopathic epilepsy.

For instance, Vance[2] has reported a case of severe epileptiform convulsions without any described sign of organic brain disease, a year after the primary infection, not improved by bromide and quickly ceasing under iodide. In a case related by Broadbent[3] several fits occurred thirteen years after primary syphilis, and some others after a year's interval; they then become more frequent, and in the course of six years they increased in frequency until the patient had five or six in a day without warning. They ceased entirely on iodide being given, but the patient had a subsequent attack of mania which left persistent mental derangement.

Hysteria.—The subjects of syphilitic cerebral disease often manifest symptoms which we associate with hysteria, as do also patients with other organic affections of the brain. Severe hysteria

[1] Fournier: Ann. de Dermatologie et de Syphiligraphie. 1880, pp. 16 and 199.
[2] Vance: American Journal of Syphilography. July, 1871.
[3] Broadbent: Brit. Med. Journal. Feb. 14, 1874, p. 197.

is also occasionally met with in syphilitic subjects who present no sign of organic disease, as Zambaco[1] first pointed out. Fournier has lately called attention to the frequency with which such symptoms are observed in prostitutes under treatment for secondary symptoms, and he regards it as a transient syphilitic neurosis, not due to organic brain lesion. It seems not improbable, however, that it may be a moral and not a physical effect of the disease: the result of the depressing influence of a morbid state and surroundings, acting on a nervous system during reaction from the excitements of an immoral life, and not in any sense of specific origin.

Insanity.—The question of the relation of syphilis to mental derangement is in nearly the same position as its relation to epilepsy. Psychical disturbance, as already said, is a frequent symptom of syphilitic brain disease of every kind, but whether such disturbance results from syphilis, except by the agency of organic changes, is still an open question.

The mental disturbance which attends organic disease is often characterised, at first, by delusions and excitement, but the latter gives place, after a time, to mental feebleness, loss of memory, inattention to what is passing around, and ultimately to profound dementia. Headache may be present in the early stages, and there are often paralysis of cranial nerves and other indications of intracranial disease. These usually precede the psychical derangement, but the latter in some cases comes first. The most frequent cause of the condition is chronic meningitis, but it may also result from syphilitic growths without meningitis. In arterial disease, as has been stated, the paralytic symptoms are often associated with a state of peculiar hebetude and partial dementia.

A good illustration of the association of mental derangement with other symptoms of meningitis is afforded by a man whose history has been kindly communicated to me by Dr. G. H. Savage.

A man, aged 25, five years after contracting syphilis, had an attack of acute mania, for which he was admitted into Bethlem Hospital, where it was found that he had distinct syphilitic disease of one testicle, and also paralysis of one third nerve. The primary sore had occurred six years before. From the maniacal condition he slowly passed at the end of a month into a condition of profound dementia, so that he had to be fed by force. Optic neuritis was then found and paralysis of the sixth nerve came on. He was treated with mercury and iodide, but for a long time there was no improvement, and he seemed almost at the point of death. Then he began slowly to improve, and was finally discharged quite well six months after his admission. He was kept under observation for three years and was frequently attacked with some cutaneous or other syphilitic trouble, but presented no further mental symptoms.

In another case, also under the care of Dr. Savage, a woman, who had had

[1] Zambaco: Loc. cit., p. 451.

several miscarriages and had lost her hair, was admitted with a peculiar form of mania, the periods of excitement being nocturnal. During the day she would lie quiet, and at night become violent. After the mania had existed for a few weeks, she passed into a condition of dulness and of sleepy apathy. Under iodide she slowly improved, and was discharged well at the end of four months.

Another instance of nocturnal excitement is related by Th. Simon. The patient suffered from headache and dementia with restlessness and excitement at night. After death a cicatricial gumma was found in the brain, with chronic meningitis, especially on the right side.[1]

Death may occur in these cases during the period of excitement: an illustration of this is afforded by one of the earliest published examples of mental derangement from syphilis, recorded by Hildebrandt.[2]

A subject of constitutional syphilis presented signs of mental derangement, had his house illuminated every evening, and thought that he had interviews with distinguished persons, Lord and Lady Palmerston and others. He had also paralysis of the third nerve. He became deaf, had attacks of giddiness, and died from diarrhœa. The dura mater was found thickened over the temporal bone; the arachnoid was thickened, the third nerve was greatly enlarged, the auditory nerve was also thickened and opaque. Some of the cerebral arteries were plugged, causing small areas of softening.

These cases are illustrations of a numerous class in which mental disturbance is the conspicuous symptom of organic brain disease, and brings the patient under treatment. They are forms of 'symptomatic' insanity.

We know very little of mental derangement the result of syphilis, and not due to organic disease. Cases which are supposed to be of this nature have been recorded, but their significance is lessened by several considerations: (1) the organic disease (*e. g.* meningitis) which causes the mental derangement, may cause no other symptoms. This was possibly the case in a patient whose history Simon has recorded.[3] A man, aged 37, who had had frequent nodes during ten years, after some soft nodes on the exterior of the skull became excited, had a sleepless night, and next day passed into a condition of mania. Iodide was given, and in a few days he recovered. (2) Attacks of simple insanity may occur in the subjects of constitutional syphilis without there being any connection between the two morbid states. A certain proportion of the adult members of most communities have suffered from syphilis, and it is evident that syphilis may be an antecedent of mental derangement in the same proportion of the insane, by simple coincidence. (3) Syphilis no doubt occasionally causes insanity in

[1] Th. Simon: Arch. f. Dermat. u. Syph. 1873, p. 398.
[2] Hildebrandt: De la Syphilis dans ses Rapports avec l'Alienation Mentale. 1859.
[3] Th. Simon: Loc. cit.

an indirect manner by the mental depression which it induces. The evidence which has been chiefly relied on, as a proof of the specific nature of the mental derangement, is the beneficial effect of anti-syphilitic remedies. This evidence, however, needs to be carefully investigated to avoid the many fallacies to which it is liable.

On the other hand, it must be remembered that the difficulty of ascertaining the antecedents of insanity is often great, especially in regard to those points in the previous history which can only be learned from the patient. It is quite possible that the proportion of cases with syphilitic antecedents may be much larger than is at present believed. It must be also remembered that the absence of improvement from anti-syphilitic treatment, does not entirely exclude syphilis from the causation of a disease.[1]

General Paralysis of the Insane sometimes occurs in syphilitic subjects, but there is, at present, no adequate evidence of a causal relation between the two diseases. The course of the affection, in such cases, is not influenced by anti-syphilitic treatment, and the lesions found after death, do not differ from those met with in patients who have not had syphilis.

Symptoms which bear some resemblance to general paralysis of the insane sometimes occur in the subjects of organic brain disease of syphilitic origin, especially chronic meningitis. This form, which has been called by Fournier[2] 'pseudo-general paralysis,' is characterised by convulsions, muscular weakness, tremor of lips, a tendency to exaltation, passing into mental weakness and imbecility. There is vague self-satisfaction rather than the strong delusions of greatness seen in ordinary general paralysis. The course of the disease is less uniform and less rapid, and the symptoms often commence suddenly, with indications of actual organic disease, and this, especially chronic meningitis, is usually to be found after death. Lastly, anti-syphilitic treatment may improve and even cure these cases, while it has no influence on the ordinary form.

Chorea.—In a few recorded cases, an attack of chorea has coincided, in young adults, with the symptoms of constitutional syphilis, and has been described as 'syphilitic chorea.'[3] The attacks have occurred, for the most part, in women during the secondary period of the disease. In their character they do not differ from ordinary chorea. It is possible that the association of the two diseases is accidental, or that they are only indirectly connected. The rarity with which the two diseases coincide is in favour of this view. On the other hand, in one or two cases, anti-syphilitic remedies have had

[1] See on this subject, Mickle, British and Foreign Med.-Chir. Review, July and October, 1876, and April 1877; and Journ. Mental Science, 1879, pp. 389 and 505.

[2] Fournier: La Syphilis du Cerveau, p. 333.
Zambaco: Loc. cit., p. 443. Alison: Am. Journal Med. Science. July, 1877.

an apparent effect on the disease. An illustration of this is afforded by the following case recorded by Zambaco.[1]

A girl at the age of 20 years was attacked in 1858 with general chorea, attributed to fright; and the movements were severe and characteristic, occupying the shoulders, arms, and trunk muscles. She received for four months the ordinary treatment for chorea without improvement, and then left the hospital. She returned three months later, and exhibited no diminution in the movements; the legs had also become involved. She had become deaf, and presented a general eruption of furunculous ecthyma, syphilitic vitiligo of the neck, swelling of the cervical and occipital glands, and 'mucous patches' upon the tonsils. Mercury was ordered, and in a fortnight there was a distinct improvement, and in two months the chorea had ceased.

Even this case, however, cannot be regarded as conclusive, since admission into a hospital, after chorea has lasted for several months, is often followed by rapid recovery, although no medicine is given, while at an earlier period in the disease improvement after admission is less frequent.

Vertigo.—Giddiness is very common in cases of constitutional syphilis in which the nervous system suffers. It is produced by more than one mechanism. It is a frequent result of central disease, tumour or meningitis, in various situations. It may also result from weakness of ocular muscles. The action of these muscles constitutes one of the most important sources of information of the position of the body in relation to external objects, and if their action is deranged, the information derived from this source ceases to be in harmony with that supplied from other sources, and uncertain equilibration, *i.e.*, giddiness, results. Still more important afferent impressions of the same kind come through that part of the auditory nerve, which is distributed to the semicircular canals, and derangement of its function from disease either in the nerve trunk or its distribution, often results from syphilis.

A woman, aged 45 years, who was lately under the writer's care, suffered for some time from severe attacks of vertigo, and a noise as of water rushing through her ears. The attacks of giddiness were often accompanied by vomiting. There was no deafness, but much headache. She had also suffered from syphilitic ulceration of the leg. She was ordered ten-grain doses of iodide and bromide of potassium, and the attacks of giddiness ceased in a few days. The bromide was then omitted, the iodide being continued. The noise gradually lessened till it was like distant bells; all the hissing and rushing sound ceased, and the headache was much slighter. The iodide was gradually increased to ʒss. three times a day, and the headache ceased entirely, and the tinnitus was reduced to a slight occasional sound.

It may be noted that in a case of severe giddiness with deafness in a subject of constitutional syphilis, Moos of Heidelberg found a

[1] Zambaco: Loc. cit., p. 443.

small celled infiltration of the membranous labyrinth, especially of the ampullæ of the semicircular canals.[1]

The Spinal Cord.—Of the syphilitic lesions which occur in the brain and its membranes, two, chronic meningitis and growths, frequently occur within the spinal canal. The occurrence of syphilitic disease of the vessels is also probable, although not yet proved. Besides these morbid processes there is strong evidence that disseminated myelitis, irregular in its distribution, may result from syphilis, and that the disease is at least one cause of certain chronic degenerations, limited to one or more of the constituent tracts or 'systems' of fibres of the cord.

Growths, as in the brain, commonly spring from the membranes, the dura mater or pia mater. Occasionally they appear to commence within the substance of the cord, and to have no connection with the membranes. In these cases they probably spring from the thick trabeculæ of connective tissue which extend into the white columns from the pia mater. The growths are usually small, more or less rounded masses, varying in size from that of a pea to that of a hazel-nut. When springing from the dura mater, they may simply compress the cord, but more frequently they actually invade it. The new growth occupies, however, more space than the tissue which it replaces, so that the bulk of the cord is increased at the spot, and parts not invaded are compressed and displaced. The tissue adjacent to the growth may, like that in the brain, be softened. The appearance of these tumours is similar to those which occur in the brain. They are reddish grey and translucent in the recent parts, but present the same tendency to caseation as is seen elsewhere, and hence the centre of the growth usually contains several cheesy areas. There may be more than one growth, as in the case described on p. 220. The damage which they cause to the substance of the cord often leads to secondary degenerations, ascending in the posterior median column when the growth damages this part, descending in one or both lateral columns (lateral pyramidal tracts), when those are implicated. Moreover, the nerve roots which enter the cord at the position of the growth are often diseased. If the anterior roots suffer, or if the growth involves the anterior cornua, secondary degeneration may be traced along the motor nerves. Syphilomata may occur in any part or region of the cord. They usually damage one side before the other.

A widely spread formation of 'miliary' syphilomata in the membranes has been described,[2] but is an exceedingly rare lesion. Sometimes a diffuse syphilitic growth occurs outside the dura mater.

[1] Moos: Virchow's Archiv, vol. lxix., Pl. II., p. 313.
[2] Engelstedt: Archiv der Heilkunde, Bd. iv. 1863, p. 169.

Thus Westphal has recorded the case of a woman who died with paraplegia of subacute onset. The sacral canal was filled by a mass, partly gelatinous, partly hæmorrhagic, which had invaded the dura mater, and encapsuled the nerve roots. Numerous circumscribed growths were also scattered over the dura mater.

Meningitis.—When syphilitic growths spring from the spinal dura mater, the adjacent part of the membrane often presents a diffuse thickening, 'pachymeningitis,' which may extend all round the cord for a variable vertical distance. A similar change may occur in the nerve tissue, just as within the skull, without any local growth. The nerve roots are compressed as they pass through the thick indurated membrane. The disease may affect, chiefly, either the outer or the inner surface of the dura mater. The membrane becomes adherent, in the former case to the bone, in the latter to the spinal cord. The arachnoid and pia mater may also be involved, and the superficial layer of the cord itself may be damaged. The dura mater over the greater part of the cord may be thus affected, or the change may be confined to the membrane over the cervical or lumbar enlargement, or to that of the dorsal region.

The pia mater may be inflamed independently of the dura mater. It may be visibly reddened and thickened, or may appear normal to the naked eye; though evidence of inflammation—collections of embryonal cells and distended vessels—may be found on microscopical examination. This is often the case in the neighbourhood of spots of disseminated myelitis.[1]

In some cases a mass of exudation occupies the whole space between the dura mater and the pia mater, and involves the arachnoid, so that it is impossible to say in which membrane it originated. Thus in a case of paraplegia recorded by Zambaco,[2] the lower half of the dorsal, and the lumbar regions of the cord were surrounded and compressed by a gelatinous effusion, adherent to both pia and dura mater.

Occasionally the membranes of both brain and cord are simultaneously inflamed. Thus Bruberger[3] has recorded a case in which all the membranes in the cervical region were blended together in a dense mass which was adherent in parts to the inner surface of the bony canal. There was also extensive meningitis at the base of the brain, the pia mater and arachnoid being transformed into a dense, grey, jelly-like mass. The vessels of the skull were also diseased.

In rare cases disease of the membranes is connected with syphilitic disease of the bodies of the vertebræ. In a syphilitic man,

[1] Julliard: Localisations Spinales de la Syphilis. 1879, p. 60.
[2] Zambaco: Loc. cit., p. 251.
[3] Bruberger: Virchow's Archiv, Bd. lx., p. 285.

aged 24, who died with pressure on the cervical cord, there was found caries of the posterior surface of the second, third, and fourth cervical vertebræ, and opposite this, outside the dura mater, a gummatous growth eight centimetres long, which surrounded and had compressed the cord, without, however, penetrating the dura mater.[1]

Myelitis.—Acute Myelitis occasionally occurs in the subjects of constitutional syphilis. The connection of the two is not demonstrated by any pathological facts, but their clinical association is occasionally striking. Several cases in which the symptoms of acute myelitis followed syphilis have come under the writer's notice, and in one such case, in which the primary infection occurred eighteen months before the attack of myelitis, Broadbent[2] found softening of half an inch of the spinal cord, just above the lumbar enlargement. It is possible that in some cases, acute softening of the cord may be produced by a mechanism similar to that which causes acute softening of the brain in syphilis, viz., by disease of vessels cutting off the blood supply.

Subacute and chronic myelitis.—It was formerly supposed that, when paraplegia occurred in constitutional syphilis, and came on in a subacute or chronic manner, the cord was always compressed by a syphilitic growth. Recent investigations, however, especially those of Pierret,[3] have demonstrated that, in many of these cases, the lesion in the cord is a disseminated myelitis leading to areas of inflammatory sclerosis. The spots affected, which may be scattered through a considerable portion of the cord, have a grey aspect to the naked eye; and, under the microscope, the interstitial tissue is found to be increased in quantity by collections of lymphoid and branched cells. The change seems to commence in the walls of the vessels, and in the connective tissue septa, and is most marked towards the surface of the cord, so that it may even assume an annular distribution. The pia mater may be similarly affected. The histological characters vary according to the acuteness of the process. When rapid, acute changes in the nerve fibres may be more marked than the interstitial changes. In rapidly developed cases there may be actual softening. In more chronic cases there are scattered foci of sclerosis. In a case, the history of which has been given by Julliard,[4] Pierret found sclerosis in the upper dorsal regions, affecting chiefly the lateral columns. The change appeared to have started from the walls of the vessels, which were increased in some places, to double

[1] C. K. Mills: Philadelphia Med. Times, 1879, Nov. 8.
[2] Broadbent: Brit. Med. Journal. 1874, vol. i., p. 101.
[3] Pierret: Observations published by Julliard, loc. cit., p. 53.
[4] Julliard: Loc. cit., p. 57.

their normal thickness, and surrounded by islets of sclerosis. The paraplegia developed in the course of three months, seven years after the primary infection. Many cases of similar character are on record, in some of which the evidence of a relation of the disease to syphilis is not conclusive.

Sclerosis of the Posterior Columns; Locomotor Ataxy.—There is strong reason from clinical evidence to believe that primary sclerosis of the cord, limited to certain of its constituent elements—the white columns or grey matter—may result from syphilis. The evidence is strongest in the case of posterior sclerosis—locomotor ataxy.

The occasional obtrusive association of syphilis with locomotor ataxy did not escape the keen eye of Duchenne, and his allusion to the subject, in his original papers on the disease, is worth quotation. "Some [ataxic] patients had suffered from constitutional syphilis; it was the only reasonable or apparent cause of the ataxy, but the causal relation is uncertain, for, apart from the special symptoms of syphilis, at its different periods, the locomotor ataxy presented, in these patients, no new or special symptoms, and specific treatment, as a criterion, was equally useless."[1]

No subsequent writer, with the exception of Schultze,[2] attached any importance to the association, until in 1876 Fournier[3] insisted on its frequency. His experience that syphilis preceded ataxy in twenty-four out of thirty cases which had come under his notice was generally regarded as due to the special character of his practice. Vulpian, however, to whose sphere of observation that objection does not apply, stated in his lectures,[4] published in May 1879, that "there are actually few patients with locomotor ataxy who have not had, some years before the appearance of the first symptoms of this affection, an infecting chancre and secondary syphilitic accidents. . . . . I do not think that it is an exaggeration to say that of twenty patients attacked with locomotor ataxy there are at least fifteen who are old syphilitic subjects." Attention has been specially drawn to the subject by a paper by Erb, published in July, 1879,[5] in which he stated that of forty-four cases observed consecutively, there was a history of antecedent syphilis in twenty-seven, or sixty-one per cent.

Statistics of a different character have been brought forward by German authorities, whose opinions are entitled to great weight. Westphal,[6] of seventy-five cases, found that 18½ per cent. had had

[1] Duchenne: Arch. Gén. de Méd., sér. v., tome xiii. 1859, p. 439.
[2] Schultze: Inaug. Diss. Berlin, 1867.
[3] Fournier: Gazette Médicale de Paris, 1876, No. 53.
[4] Vulpian: Leçons sur les Maladies du Système Nerveux, 1879, p. 245.
[5] Erb: Deut. Arch. f. klin. Med., Bd. xxiv., p. 42.
[6] Westphal: Berlin. klin. Wochenschrift. 1880, Nos. 10 und 11.

primary sores only, and another 14½ per cent. had had secondary symptoms. E. Remak[1] found a history of syphilis in only one quarter of fifty-two cases, and Bernhardt[2] in the same proportion of thirty-seven cases.

The facts which have come under the writer's notice corroborate the statements of Fournier, Vulpian, and Erb. In 1878, in a paper read at the Bath meeting of the British Medical Association,[3] the opinion was expressed that syphilis must be regarded as a cause of locomotor ataxy in one-half of the cases of that disease.

Of thirty-three cases observed consecutively, and in which the question of previous syphilis was carefully investigated, eighteen presented a clear history of constitutional syphilis, of whom fifteen described both primary sore and secondary symptoms, and three presented or described distinct secondary symptoms, although they were ignorant of having had a primary sore. Five other patients had had a sore, but no secondary symptoms could be ascertained. In the remaining ten cases there was no history of a sore or constitutional symptoms. One of these, however, had had a rash which he was sure was syphilitic, but he was told by a medical man that it was not. Of these ten patients five had suffered from gonorrhœa. Thus, of the whole thirty-three cases, twenty-three (about 70 per cent.) had suffered either from a primary sore or secondary symptoms, and in 53 per cent. there had been undoubted constitutional symptoms, of which in several the indications were still present.

The significance of these facts depends on the proportion of the male population of this country who have had primary sores or constitutional syphilis. Before assuming a causal relationship in these cases between the antecedent venereal disease and the subsequent locomotor ataxy we ought to deduct from the coincidences that proportion which the prevalence of venereal disease may have rendered accidental. Unfortunately, we have not the necessary information. But it is probable that the proportion of adult males, over twenty-five, who have had venereal sores or symptoms of constitutional syphilis is much smaller among the middle classes than among the poor. It is therefore of interest to inquire whether syphilis precedes ataxy with equal frequency in the two classes. Of the thirty-three cases, twenty-one were seen in hospital practice, and twelve in private. Of the former there was a history of constitutional syphilis in ten, and of a venereal sore alone in five, making a total of two-thirds of the hospital cases. Of the twelve cases seen

[1] **Remak**: Berlin. klin. Wochenschrift. 1880, Nos. 10 u. 11.
[2] **Bernhardt**: Ibid.
[3] **Gowers**: Syphilitic Neuroses, Brit. Med. Journ. Aug. 31, 1878, p. 318, and March 1, 1879, p. 303.

in private there was a history of secondary syphilis in eight, and of a venereal sore alone in one, a total of three-quarters of the cases. These facts suggest that syphilis is an antecedent of ataxy, at least as frequently in the well-to-do classes as among the poor. If we deduct twenty per cent. as explicable by accidental coincidence, there will still remain fifty per cent. of the cases of ataxy in which we must regard the antecedent syphilis as the essential cause of the disease. It may not have been the only cause of the disease; sex, for instance, doubtless has an influence, but the teaching of these facts, so far as they go, is, that one-half of the patients with ataxy would not have this disease if they had not, at some previous period, suffered from syphilis.

How is this conclusion to be reconciled with the figures of Westphal, Bernhardt, and Remak? These facts were published soon after, and in contravention of the statements of Erb, and were manifestly based upon old notes of cases. Statistics so obtained are, it is well known, of very doubtful value upon many points, and, according to my own personal experience, upon this point for one. Erb himself affords an illustration of the change of opinion which may occur when attention is specially directed to a question. In his article in "Ziemssen's Cyclopædia" (written apparently in 1876), he said: "Among chronic diseases, syphilis has been often credited with being the cause of tabes, with what justice cannot as yet be determined. . . . . Judging by my own experience this connexion seems doubtful."[1] His changed opinion in 1879 I have already stated.

In women it will probably be found that the proportion of cases presenting syphilitic antecedents is much smaller. Such is the experience of Erb and Westphal, and with it the writer's observation agrees, although the cases are too few to justify a confident statement.[2]

The lesion in locomotor ataxy is, however, very different from those which are ordinarily caused by syphilis. It is a degeneration limited to a system of structure, and contrasts with the random distribution of ordinary syphilitic processes. This objection has been urged with force by Broadbent, Julliard, Westphal, and others, and the writer can corroborate the statement of Westphal that in cases which succeed syphilis the lesion is precisely similar to that

[1] Ziemssen's Cyclopædia, American translation, vol. xiii. (1878), p. 528.

[2] Westphal's 75 cases included 20 women, in none of whom was there a history of syphilis. If these 20 cases are deducted, the proportion of the 55 men who had had secondary symptoms rises to 20, and a chancre only, to 25 per cent., making a total of 45 per cent.

Erb has informed the writer that of 108 cases of locomotor ataxy he has observed that 59 per cent. had suffered from secondary syphilis, another 27 per cent. had had primary sores, and in only 14 per cent. was there no history of either. On the other hand, of 400 non-ataxic male adults, only 23 per cent. had had either sores or secondary symptoms.

found in other cases. But theoretical considerations of this character must yield to facts. We know too little of any morbid agency thus to limit its possible operation to certain forms of effect, with which we happen to be familiar. Indeed, a study of the morbid changes which are universally admitted to be syphilis might make us hesitate in exclusions. In the falling off of the hair after syphilis we have a change which no one hesitates to ascribe to syphilis, but which is very unlike its other consequences, and might almost be described as a true "degeneration of a system of structure."

The common failure of anti-syphilitic treatment in ataxic cases, which Duchenne pointed out, has been confirmed by most subsequent writers, with the exception of Fournier. It is, however, not altogether surprising, when we remember how different in character the lesion is from those which are commonly influenced by iodide and mercury. The failure of the therapeutic test cannot be held as invalidating other adequate evidence as to the causal relation of the two diseases. But although, as a rule, anti-syphilitic remedies have no marked influence on the disease, occasional exceptions are met with, and the writer has seen one case of early ataxy in which iodide and mercury effected a practical cure.

As a rule, the interval between the syphilis and the first symptom of the ataxy is considerable. It was noted by Erb in only seventeen cases. In five it was between two and five years, in eight between six and ten, in four between eleven and fourteen. In the writer's cases the exact interval was noted in eighteen cases. The interval is, as a rule, longer than in Erb's cases. No case of simple tabes was met with earlier than seven years after infection, the actual numbers being: at seven years, one; at nine, three; at ten, two; at thirteen, three; at fourteen, two; at fifteen, one; at seventeen, one; at twenty, three; at twenty-one, one; at twenty-five, one. Thus two-thirds of the cases occurred more than ten years after the primary disease.

Some other degenerative diseases of the spinal cord occasionally succeed syphilis in a way that suggests a causal relationship. The association is occasionally seen, for instance, in spinal muscular atrophy—degeneration of the anterior cornua. It seems, therefore, that a late result of syphilis may be a 'neuropathic' state, in which degenerative diseases of the nervous system readily occur.

Occasionally this tendency leads to the occurrence of degenerative changes, secondary to damage from other disease (meningitis, growths, myelitis, injuries). Thus a patient sometimes suffers from symptoms of syphilitic growth in the cord, paraplegia: under treatment power returns, and afterwards incoordination gradually comes on and extends in spite of treatment, from a persistent and progressive degene-

ration in the posterior columns. These cases are readily intelligible on the theory that syphilis predisposes to degenerative changes; the acute degeneration set up by the growth leads to secondary chronic degeneration which runs an independent course.

In rare cases the symptoms of 'acute ascending spinal paralysis,' have been met with in the subject of constitutional syphilis, and, after death, as in other cases of the same character, no lesion has been found to which they could be ascribed.[1]

Symptoms.—Symptoms of irritation, that is to say, pain referred to the spine and limbs, local tenderness and spasm, are observed both in growths and chronic meningitis. The pain in either case may be referred to the limbs, or more frequently to the parts supplied by the nerves which are given off at the position of the lesion. Such pains often radiate around the trunk and may be accompanied by a zone of hyperæsthesia, and sometimes by patches of anæsthesia due to greater damage of some nerve filaments. With these there may be various dysæsthesiæ, 'numbness,' 'tingling,' 'pins and needles,' and the like; and some sense of stiffness or actual rigidity in the limbs. Rigidity is rarely a conspicuous symptom early, but occasionally, in widely spread chronic meningitis, there may be general rigidity, or even opisthotonos. Spasm in the limbs is much more frequent as a late symptom, and is then, as will be explained, of different origin.

Paralysis may result from damage to the cord by growths, or from compression by chronic meningitis, or from damage to the nerve roots. In the latter case, and also when the disease of the cord involves the anterior cornua from which the nerves arise, there is muscular wasting, and the electrical 'reaction of degeneration,' *i.e.* loss of faradaic irritability with preservation and even increase of the voltaic irritability. The distribution of the wasting depends on the distribution of disease in the cord. If this is in the dorsal region there is no wasting in the limbs, but weakness and perhaps impaired sensibility of the legs result from the damage to the conducting tracts. Such affection of sensation is widely spread. Disease of the nerve roots may also cause anæsthesia, but this is commonly confined to limited spots.

The disease of the cord also alters the reflex actions. Meningitis (by damaging the roots), or growths, or degenerations in the cord at the same level, abolish reflex actions both from the skin and deeper structures, at the spot diseased. When, however, the disease is above the part of the cord concerned in the reflex action, this is commonly excessive, and the excess of the 'muscle-reflex actions' (evidenced by the excessive contraction in muscles on tapping the tendons,

[1] Déjerine and Goetz: Archives de Phys. 1876, p. 312.

or on suddenly making the muscles tense) appears to be especially related to the occurrence of a secondary descending degeneration in the lateral columns. Thus, disease in the upper part of the lumbar enlargement may abolish the knee jerk and cremaster reflex. If the disease is in the dorsal region, the abdominal reflex may be interfered with, and the reflexes from the leg may be in excess. This excess of the deep muscular reflexes may go on to the production of rigidity or spasm, commonly extensor in character. The legs when extended are stiff and rigid and sometimes are jerked in clonic spasm (spinal epilepsy). Occasionally the flexor spasm predominates, and the legs are drawn up.

The symptoms are thus distributed in the several lesions. Those due to *growths* are gradual in onset, occupying usually several weeks in development. They may be limited when the growth is small. If unilateral, one leg only may be paralysed, and sensation may be affected on the side opposite to the motor paralysis. When bilateral, one leg is often affected before the other. When in the posterior columns, there may be incoordination only. In the region supplied by the nerves which come off at the level of the growth there may be pains and hyperæsthesia, or anæsthesia and muscular wasting with loss of reflex action. In the parts below, there is paralysis, the character of which depends on the seat of the growth in relation to the conducting tracts. In the paralysed parts the reflexes are in excess, and there is often slowly developed spasm. Thus a growth in the dorsal region causes weakness in the legs, usually first in one then in the other, with or without affection of sensibility, and of the sphincters. Afterwards there is excessive reflex action, and occasionally spasm. At the level of the lesion there are pains around the trunk, unilateral or bilateral, hyperæsthesia, patches of anæsthesia, and loss of the trunk reflexes at the spot. If, however, the disease is in the upper part of the lumbar enlargement, the weakness, also at first unilateral, may be accompanied by wasting in the glutei or extensors of the knee, with pains referred to the groin, scrotum, &c.

In *chronic meningitis* the symptoms are also gradual in development, and consist in pains referred to the distribution of the nerves, often accompanied by hyperæsthesia and patches of anæsthesia, and by muscular wasting. If widely spread, and involving the membranes over the lumbar or cervical enlargements, the wasting may be so extensive as to resemble that of progressive muscular atrophy, differing, however, in the association of anæsthesia, and often, in the less regular distribution of the wasting. The reflex actions are lessened or lost in the parts to which the nerves go, which pass through the diseased membranes. Ultimately

the cord may be compressed, and then there is paralysis in the parts below the meningitis, not attended by wasting but presenting excess of reflex action. Chronic syphilitic meningitis in the dorsal region, may thus cause impairment of sensibility over the trunk, by damage to the dorsal nerve-roots, and by pressure on the cord, paralysis of the legs, without affecting sensation, but with excess of reflex action. The cervical region is, however, a more frequent seat of syphilitic meningitis, and the symptoms, produced by damage to the nerve roots, then occur in the arms. Of meningitis in this situation the following case, which has been recorded by Buzzard,[1] affords a good illustration.

A man had suffered from fits in childhood, and, at 21, from some form of keratitis. At about 27 he had a venereal sore. At 34 the fits recurred. At 35 he suffered from severe pains and painful numbness in the arms and across the back, and rheumatic pains in the legs, and then his arms and legs, in a few days, became weak, although not powerless. There was some improvement under iodide and mercury; but a month later wasting of the interossei and lessened faradaic irritability was found. During the next month there was considerable improvement, but this was followed by severe paroxysms of burning pain in the arms and greater unsteadiness on the legs. The muscular wasting in the arms increased in extent; in the left there was increased sensibility to cold, delayed perception of pain. In spite of specific treatment, the weakness in the arms increased, the legs and intercostal muscles became paralysed, and the patient died comatose five months after the onset of the symptoms. After death there was found syphilitic disease of the basilar artery, and in it a clot had formed, causing softening of the right crus, pons, and medulla (to this the final coma and death were probably due). In the upper dorsal and lower cervical regions the dura mater and pia mater were found matted together, and opposite the lower part of the cervical enlargement, hard tissue, one-tenth of an inch thick, united the membranes. The substance of the cord was softened, "of the consistence of rotten cheese," for about two inches opposite the greatest meningeal disease, and at one point it was almost fluid. Microscopical examination demonstrated extreme infiltration of the substance of the cord with new cells and degeneration of the nerve elements (secondary myelitis).

The combination of cerebral and spinal meningitis may cause symptoms of very wide range. When acute, the cerebral and spinal symptoms may come on together. When chronic, they may occur at different periods, as in a case recorded by Vance.[2] A man, aged 43, five years after primary syphilis suffered from symptoms of cerebral meningitis, mental excitement, paralysis of the left fifth and third nerves, and epileptiform convulsions. In the following year there occurred boring pains in the dorsal region of the spine, paralysis of the legs, and wasting and anæsthesia in the arms, while the mental excitement gave way to dementia.

[1] Buzzard: Brain, Part IX. April 1880, p. 57.
[2] Vance: American Journal of Syphilography and Dermatology, July, 1871, Case iv.

Acute myelitis causes paralysis of rapid onset, the distribution of which, and the symptoms with which it is associated, depend on the position and character of the inflammation, and cannot be described here. In *subacute myelitis* the symptoms are gradual loss of power in the legs, sometimes with wasting, bedsores, &c., but rarely with considerable loss of sensibility. Although as a rule chronic, their course is often marked by acute exacerbations as in the case narrated at p. 236.

The symptoms of *posterior sclerosis, locomotor ataxy,* occurring in the subjects of constitutional syphilis present the well-known characters—incoordination of movement, without primary loss of power, sharp darting pains, loss of the knee-jerk ('patellar tendon reflex'), impairment of sensation, myosis with loss of the reflex action of the pupil, and sometimes optic nerve atrophy.

Spinal muscular atrophy, from degeneration of the anterior cornua, also presents features similar to those met with in patients who have not had syphilis. As in locomotor ataxy, specific treatment has little influence on the disease, but for the reasons stated on p. 233 this cannot be held to invalidate other evidence of the relation of the disease to syphilis. The following cases illustrate the occurrence of the disease in syphilitic subjects.

James H., aged 36, with no neurotic heredity, had a chancre eight years before admission. Seven years afterwards, he found he was losing the power of using his fingers, and soon afterwards the movement of his tongue became impaired. On admission, there was drooping of both eyelids, said to have existed from birth. The ocular and facial movements were normal. There was atrophy of the right half of the tongue. There was no paralysis of the palate. Both sterno-mastoids were thin, especially the sternal portion on each side. There was wasting of the pectorals, deltoids, biceps, triceps (less), of the forearm muscles (especially at the back), and of the interossei and thenar muscles. The legs were weak; the right was generally thin; there was no special muscular wasting. He could, however, manage to walk a mile. Both so-called 'knee-jerk' and ankle clonus could be obtained; the latter present in each foot. This patient denied that he had any venereal affection beyond an attack of gonorrhœa, and no indirect history of syphilis could be obtained. The information stated above regarding the chancre was kindly furnished by Mr. Wagstaff of Lincoln, under whose care the patient was, and who also stated, that, soon after acquiring the primary sore, the man communicated the disease to his wife, and that she was suffering from general muscular atrophy, very similar to that of which the husband was the subject.

Elizabeth G., aged 28, sent to the writer by Mr. Berkeley Hill, when admitted to hospital, was a thin, spare woman, with well-marked muscular atrophy. The arms were almost powerless at the shoulders and wrist-joints. Both deltoids were much wasted, and the arms could not be raised above the level of the shoulders. The triceps and biceps were little wasted, and possessed moderate power, but the forearms were greatly wasted. The wrists could not be moved, and were fixed in pronation; the interossei and thumb-muscles were practically gone, and the hands presented well-marked *main en griffe,* and were powerless.

Faradaic irritability was low, but equal in the two sides, even in the interossei; but it was gone in the right thumb-muscles. The legs were very weak, both at the hip and knee-joints. The muscles were flabby, but not conspicuously wasted; electric irritability was normal. The tongue was unaffected, but tremulous. There was some difficulty in swallowing, less marked with solids than with liquids. Articulation was very defective; the explosives were slovenly pronounced, *d* and *t* worse than *p* and *m*; *a* could be pronounced; *k* and *g* hard, were pronounced *ch* and *gh*. There were traces of an old right-sided facial paralysis, with secondary contracture. No affection of other parts supplied by cranial nerves was found. The patient's mind was extremely emotional; no other disturbance. Her history was that nine years before, she had had syphilis, followed by well-marked constitutional symptoms, but no specific symptoms had occurred for some years. There was no history of intemperance, or inherited tendency to nervous disease. Four and a half years before admission, she had an attack of right-sided facial paralysis. Two years later, she noticed that the left arm and leg gradually became weak, and, some months afterwards, the right arm and leg also; and she then gradually became able to walk only with assistance, and, for the last six months, not at all. Wasting of the arms was not observed until a year after the weakness began; but it was only noticed when the commencement of the deformity of the hand drew attention to it. The difficulty in speech commenced at the time she first noticed the wasting. Anti-syphilitic treatment of each kind was thoroughly carried out, but without the slightest improvement.

In a case of progressive muscular atrophy reported by Déjerine,[1] the patient suffered at the same time from syphilitic rupia.

The course of syphilitic diseases of the spinal cord varies according to their character, duration, and according to the treatment adopted. The symptoms of growths are of gradual development, and if proper treatment is early adopted, may entirely pass away. The cord is chiefly damaged by pressure, and may recover if the compression ceases. If the pressure lasts long, so much tissue may be destroyed that persistent damage results. Meningitis has a gradual course, and the symptoms, though sometimes removed by treatment, often persist; the contraction of the tissue during recovery may maintain the compression of the nerves which pass through it. Acute myelitis, sudden in onset, tends to spontaneous recovery, but is little influenced by treatment, and if considerable, there may not be the slightest improvement. The same is true of the subacute variety. The degenerative diseases, very gradual in onset, commonly have a progressive course, in spite of treatment, although now and then, by early and energetic treatment great improvement can be obtained.

The Nerves.—The connective tissue sheaths of the nerves are not infrequently the seat of syphilitic growths, nodular and isolated, possessing the microscopical characters of gummata. They vary in size from that of a hemp-seed to that of a pea. The nerve fibres

[1] Déjerine: Archives de Physiologie. 1876, p. 430.

suffer by compression, and sometimes by the extension of syphilitic inflammation into the interstitial tissue of the nerve. The cranial nerves within the skull often suffer in this manner, and their affection is occasionally bilateral, nodules forming symmetrically on the nerves of the two sides. The cranial nerves may also suffer from the pressure of syphilitic exostoses, and still more frequently by constriction in consequence of the thickening of the membranes through which they pass, or of the periosteum in their foramen of exit.

Occasionally the nerves are the seat of a diffuse infiltration without obvious growth in the sheath. This change has, at present, been observed only in the cranial nerves. The nerves are slightly swollen, and at first reddened, at the affected spot. Subsequently they become opaque and cartilaginous. The affection consists in a spindle-cell growth which replaces the normal interstitial tissue, and causes atrophy of the nerve fibres. It may thus be regarded as a syphilitic neuritis, or as a diffuse syphilitic growth. Ultimately, the new tissue is absorbed, or undergoes cicatricial changes, but the damaged nerve fibres may not recover, and ultimately the nerve becomes narrowed, and consists of little more than the thickened sheath.

Affection of special nerves.—The cranial nerves suffer far more frequently than the spinal, and are often damaged by intra-cranial disease in their neighbourhood. In consequence, the symptoms of the disease of these nerves are often conjoined with those of cerebral lesions.

The *Olfactory nerve* has not been observed to be specially affected. Loss of smell in syphilitic subjects is commonly the result of an affection of the nasal bones. The nerve within the skull is occasionally damaged by syphilitic processes in its vicinity, tumours, meningitis, &c.

The *Optic nerve* suffers in several ways. It has not hitherto been found to be the seat of an isolated gumma, although it is occasionally pressed upon by one situated in its vicinity. It often suffers from the extension to it of adjacent meningitis, or from compression by the products of meningeal inflammation. It may be compressed by narrowing of the optic foramen in syphilitic thickening of the cranial bones, or by syphilitic inflammation at the back of the orbit. If the damage is considerable, the optic nerve in front undergoes atrophy; it shrinks and becomes grey and translucent, in consequence of the substitution of connective tissue for nerve fibres. The optic commissure may be damaged by disease in its vicinity. Indirectly it may be compressed by syphilitic disease at a distance which causes internal hydrocephalus—the distended third ventricle compresses the commissure. The optic tract is also frequently damaged by pressure. The symptoms caused by the disease of the optic fibres,

consist in alteration of sight and sometimes in visible changes in the termination of the optic nerve within the eye. Disease of the nerve in front of the chiasma affects the sight of one eye only; disease of the optic tract behind the chiasma causes loss of sight in the opposite half of each field of vision—'lateral hemiopia.' When inflammation extends to the nerve, intra-ocular neuritis commonly results. Similar neuritis also occurs in certain forms of syphilitic intra-cranial disease, especially in meningitis and growth.

The neuritis, as seen within the eye, does not present any distinctive features. The edges of the optic disc become indistinct in consequence of swelling and slight opacity of the tissues in front of it, the redness of the disc increases and invades the central cup, which becomes filled in, and ultimately the position of the disc is indicated only by a prominent greyish red mass, of two or three times the diameter of the disc. Over it the vessels curve to reach the level of the retina. The veins are enlarged, and the arteries, especially in the later stages, are reduced in size. On the swelling, and especially at its edge, striated extravasations often form. As the inflammation subsides, the swelling becomes paler, lessens, and gradually the outlines of the disc again become visible, but its centre is for a long time occupied by newly formed tissue, which often fills up the central cup, and constricts the vessels. The disc may be left permanently paler than normal, in the condition of 'consecutive atrophy.' Sight may be considerably damaged, but often suffers only after the neuritis has existed for a considerable time, and sometimes only when it is beginning to subside.

From the frequency with which these forms of intra-cranial disease occur in the subjects of constitutional syphilis, optic neuritis is very common in them. There is no evidence however that the intra-ocular inflammation is of a specific character, or differs, in any way, from that which results from other forms of intra-cranial disease. It rapidly subsides when iodide or mercury is given, but apparently as a result of the change thus effected in the intra-cranial disease.

Atrophy of the optic nerve, visible within the eye by the disappearance of the normal redness of the disc, is a result of syphilis which is produced in more than one way. It may be left by preceding neuritis, 'consecutive atrophy,' or be due to simple pressure on the nerve, 'secondary atrophy.' There is also some reason to believe that simple primary atrophy occasionally occurs as a late neural result of syphilis. Such atrophy is analogous to that of the posterior columns of the spinal cord in locomotor ataxy, which as we have seen, must, almost certainly, be regarded as an effect of syphilis. In such cases atrophy of the optic nerve may be associated with the spinal disease. It may also occur alone, in patients who

have had syphilis long before. In all these forms of atrophy, sight is more or less impaired.

The nerves to the orbital muscles are among those most frequently damaged in constitutional syphilis. They suffer by the growth upon them of syphilomata, and by inflammation of the membranes through which they pass. All may be affected on one side by syphilitic inflammation at the orbital fissure. Complete immobility of one eyeball results, coming on suddenly or rapidly, and often associated with affection of sight from simultaneous damage to the optic nerve. The nerves may also be damaged near their origin. The same nerve may in rare cases be paralysed on both sides, by being implicated in extensive mischief, or being the seat of symmetrical syphilomata. Thus the writer has seen a small growth on each sixth nerve near its origin. The sixth nerves also suffer by distant pressure: when tension is increased beneath the tentorium they suffer early, from their exposed course beneath the convex surface of the pons Varolii. The symptoms of paralysis of these nerves do not need special description. That of the third nerve is often partial, either from partial affection of the trunk, or from the disease affecting the branches to the several muscles after they have been given off. When the trunk is affected, ptosis is often noticeable before the recti become paralysed.

Paralysis of all the ocular muscles of one eye may, as already stated, result from disease damaging the nerves at the back of the orbit, and this is occasionally seen in cases of constitutional syphilis, coming on more or less rapidly. Hutchinson[1] has also called attention to the occasional occurrence of paralysis of all the muscles of both eyes, coming on gradually. The cases were, with one or two exceptions, of the subjects of constitutional syphilis, but they were not influenced by anti-syphilitic treatment. In one case he obtained a post-mortem examination, and a microscopical examination of the nerve centres by the writer showed degeneration of the centres of the third and sixth nerves similar to that which occurs in the grey matter of the spinal cord in progressive muscular atrophy. This general paralysis of the ocular muscles appears therefore to be a late 'neural' result, having a relation to syphilis similar to that borne by locomotor ataxy. In the latter disease the pupil, as is well known, often becomes small, and the iris ceases to contract under the influence of light, although it still contracts (as Arygll Robertson[2] first pointed out) when an effort at accommodation is made—the reflex action of the iris is lost, its associated action persists. This condition is often seen in cases of locomotor ataxy following syphilis:

[1] Hutchinson: Medico-Chirurgical Transactions, vol. lxii. 1879, p. 307.
[2] Argyll Robertson: Edinburgh Med. Journal. 1869, p. 696.

it may also occur, after syphilis, without any spinal disease, as the writer has seen in more than one instance. This condition is probably due to a degeneration of the reflex centre in the corpora quadrigemina, analogous to that just described. The affection does not usually progress beyond paralysis of the reflex action. In very rare cases, however, power of accommodation fails also, and then the iris ceases to contract when an effort at accommodation is made. This condition has been called by Hutchinson[1] 'ophthalmoplegia interna.' It also occurs chiefly in association with locomotor ataxy, and after syphilis, and is no doubt due to a similar, but more extensive degeneration.

The Fifth nerve is also frequently damaged by meningitis and by disease of the bone, and it is an occasional seat of gummata. Both motor and sensory parts of the fifth nerve may suffer. The muscles of mastication are paralysed, there is hyperæsthesia or anæsthesia of the skin supplied by the nerve, and taste is lost on the anterior part of the tongue. Pain in the face usually precedes, and often accompanies, loss of sensibility. The mischief may involve the Gasserian ganglion; in one case on record marked proliferation of connective tissue in the ganglion was associated with adjacent syphilitic periostitis.[2]

The Facial nerve is often damaged by syphilitic mischief, although the frequency with which it is affected by other causes, renders syphilitic facial palsy rare in comparison with the simple form. It has the distinctive characters of 'peripheral' paralysis, but the signs of nerve degeneration are often less pronounced, as the damage is less intense than in most cases of 'rheumatic' paralysis. The nerve may also be diseased at its origin at the pons. The writer has seen in a case of constitutional syphilis, simultaneous paralysis of both facial nerves, passing away in a few days under iodide and mercury.

The Auditory nerve occasionally suffers although with less frequency than other cranial nerves, perhaps on account of its more delicate connective tissue sheath. For examples of the affection of its peripheral extremity, the reader may refer to the chapter on Syphilis of the Ear.

The Hypoglossal nerve is occasionally damaged by local meningitis or pressure. Usually only one nerve suffers, and the paralysis which results is always accompanied by considerable wasting. It is common for the vocal cord on the same side to be paralysed, evidently by the damage of the highest fibres of the spinal accessory, which are, at their origin, contiguous to the hypoglossal. In these cases there is also (as Dr. Hughlings Jackson[3] first pointed out) in most cases paralysis of the levator of the soft palate, conspicuous on

[1] Hutchinson : Medico-Chirurgical Transactions, vol. lxi. 1878, p. 215.
[2] Stedman and Edes : American Journal of Med. Science. 1874, p. 435.
[3] Hughlings Jackson : London Hospital Reports, vol. iv., p. 319.

uttering the sound "ah;" the base of the uvula is drawn to one side in the movement and a dimple occurs in the palate only on the unaffected side. Syphilis is by far the most common cause of this form of paralysis.

Little is known of syphilitic affections of the *glosso-pharyngeal* and *pneumogastric nerves*. Taste has only been lost (apart from local disease in the tongue, &c.) in cases in which the fifth nerve was paralysed. The whole *spinal accessory nerve* is sometimes diseased, causing paralysis of the sterno-mastoid and trapezius, as well as of the vocal cord and palate. In such cases the tongue is sometimes paralysed on the same side, from the disease affecting the adjacent fibres of the hypoglossal.

The nerves of the limbs are very rarely the seat of syphilitic disease. Local paralyses in their region commonly result from damage to the nerve roots in consequence of disease of the spinal meninges or of the bones of the spinal column.

For instance, a patient lately under the writer's care with old syphilis and paralysis of one ocular muscle, quickly yielding to iodide, presented also paralysis with wasting of the supraspinatus, infraspinatus, and the posterior portion of the deltoid on the left side. The paralysis came on with burning pain in the lower part of the cervical spine, and was probably due to damage to the nerve-roots.

In a case related by Manssurow[1] the patient lost sensation in the little finger and adjacent half of the ring-finger. Since it affected both palmar and dorsal surfaces of the hand, and caused no muscular weakness, it could not have been due to disease of the ulnar nerve, and probably resulted from disease of the nerve roots. Recovery under iodide was complete.

Painful affections of the *sciatic nerve* are not uncommon in syphilis, and are considered in the next section. We know nothing of organic syphilitic affections of other nerves of the lower limbs. Their roots are, however, rarely damaged in spinal meningitis.

Neuralgia.—The pains of syphilis constitute one of the most prominent symptoms of that disease, but these are not usually neuralgic in character, *i.e.* do not correspond, in their seat, with the distribution of certain nerves. Pains, which bear a close resemblance to those of neuralgia occur, however, in various syphilitic affections of the nervous system which irritate nerve roots. These differ from true neuralgia in their association with other evidence of organic disease, such as paralysis in the same region, and in the absence of the definite 'tender points,' which are usually present in true neuralgia.

Anstie believed that syphilis does not cause a true neuralgia, but may evoke a neuralgia due to inherited tendency, and has

[1] Manssurow : Die Tertiäre Syphilis. Wien, 1877, p. 81.

related[1] the case of a woman who, having had severe neuralgia in early life from which she had been free for many years, contracted syphilis from her husband and had a recurrence of neuralgia associated with paralysis of some of the cranial nerves. All the symptoms passed away when iodide was given.

Other authorities (as Fournier), believe that pure neuralgia may occur from syphilis, especially in the secondary stage, when other functional nerve disorders are said to be frequent. A few instances of this character are on record. Lancereaux, for instance, has described a case in which, during an attack of syphilitic roseola, there occurred, every evening, paroxysms of severe pain in the eyes and forehead, and tender points were found in the supra-orbital, frontal, malar, and sub-occipital regions.[2] In another case, recorded by Buzzard, nine months after an infecting chancre, the patient suffered from severe occipital neuralgia. Quinine had no effect upon the pain, but it was quickly removed by iodide of potassium and mercury.[3]

In many cases which have been published as examples of syphilitic neuralgia, other symptoms have made it probable that the pain was merely the expression of an actual syphilitic lesion of the nerve. An example is the following case, recorded by Zambaco,[4] in which severe pain of a neuralgic character, in the fifth nerve, was associated with a paralytic symptom, loss of taste.

A coachman, aged 46, had suffered on several occasions from venereal sores, the last of which was six months before he came under treatment. He was then covered with syphilitic rupia, but sought relief for severe paroxysms of pain in the left side of the face, which had existed for three weeks. The pain was first felt in front of and below the ear, then along the course of the superficial temporal nerve, and afterwards extended over the whole anterior part of the head, and left side of the face. The same regions became so intensely sensitive that the slightest touch produced severe pain, and even the contact of food with the left side of the mouth could not be borne. The pain produced a profuse flow of saliva. (No mercury had been taken.) Taste was completely abolished on that side, so that salt could not be distinguished from sugar. Under mercurial treatment the pain disappeared in three weeks.

Precordial pain, most severe at night, and apparently neuralgic in nature, is occasionally met with in the subjects of constitutional syphilis, as Buzzard[5] and Eccheverria[6] have pointed out. Sometimes it is a sensation of shortness of breath, rather than of actual pain. It is quickly relieved by iodide of potassium.

Sciatica is an occasional result of syphilis, as Zambaco,[7] and most

[1] Anstie : Clin. Trans., vol. iv., p. 192, and vol. v., p. 43.
[2] Lancereaux : Traité de la Syphilis. 1873, p. 158.
[3] Buzzard : Loc. cit., p. 75.
[4] Zambaco : Loc. cit., p. 121.
[5] Buzzard : Loc. cit., p. 75.
[6] Eccheverria : Journal of Mental Science. July, 1880.
[7] Zambaco : Loc. cit., p. 103.

succeeding writers have pointed out. According to Fournier[1] it occurs especially during the secondary stage. The frequency with which it is due to syphilis has probably been exaggerated, but many clear cases are on record. Thus Zambaco has described[2] an instance of severe sciatica which came on, together with osteoscopic pains and a tibial node, nine months after an infecting sore, and rapidly yielded to iodide of potassium. In another case recorded by the same writer,[3] severe sciatica was found to be due to a small tumour beneath the gluteal muscles, which had compressed the nerve. Other syphilitic lesions were found in the body.

Diagnosis.—The diagnosis of syphilitic diseases of the nervous system is a complex problem, which resolves itself into two separable though related questions. (1) What is the position and nature of the disease causing the symptoms? (2) Is this disease due to syphilis? To consider the first of these questions, even in outline, is altogether beyond the province of the present work. It may, however, be pointed out that the position of the lesion is inferred from the distribution and character of the symptoms; its nature, from the way in which those symptoms come on. In all cases it is necessary to consider whether there is one lesion or whether there are more than one. The point is of great importance in relation to the syphilitic nature of the disease. The answer to it depends first on the symptoms present—whether they are such that any single lesion will account for them—and if so, whether all occurred either at the same time or in continuous succession. For instance, a patient (as is not unfrequently the case in syphilitic disease) has hemiplegia and paralysis of the third nerve on the same side. This combination could not be due to a single lesion, because disease affecting one third nerve, and the adjacent motor tract in the crus, would cause hemiplegia on the opposite side, not on the same side, since the motor tract decussates below the crus. On the other hand, if the hemiplegia is on the other side of the body, opposite to the paralysed third nerve, a single lesion, at the crus, would account for the symptoms, and we have then to ascertain whether the two symptoms came on at the same time.

Having considered the position and probable nature of the disease, we have next to ask the question, Is the lesion due to syphilis? The answer must depend (1) on the character of the lesion being such as syphilis is known to cause; (2) on the evidence that syphilis exists; (3) on the age of the patient; (4) on the absence of other probable causes; and (5) on the effect of anti-syphilitic treatment.

The diagnosis is sometimes easy; sometimes it is very difficult,

[1] Fournier: Leçons sur la Syphilis. 1873, p. 776.
[2] Zambaco: Loc. cit., p. 116. [3] Zambaco: Loc. cit., p. 250.

and each of these questions has to be carefully considered, before a probable conclusion can be reached.

1. *Is the lesion such as may possibly or probably be the result of syphilis?*—It has been seen that the range of symptoms which may result from syphilitic disease is very wide. Some, however, are often, others rarely, due to this cause, while there are some classes of symptoms which, as far as we know, are never due to syphilitic lesions. Hence, some symptoms suggest syphilis; others do not, in themselves, constitute evidence for or against a syphilitic origin; while others again render it improbable that syphilis is their cause. It may be worth while, therefore, to classify some of the chief affections of the nervous system according to the frequency with which they are due to syphilis.

(a) *Commonly due to syphilis.*—Subacute and chronic meningitis, cerebral or spinal: the cerebral form causing headache, convulsions, mental change, paralysis of cranial nerves; spinal, causing pain, spinal and eccentric, acute spasm, weakness in limbs, scattered anæsthesia and muscular wasting. Growths; in the brain causing headache, unilateral convulsions and paralysis, and optic neuritis: in the cord, causing paralysis, affecting usually one limb before another. Vascular obstruction in early adult life, causing a sudden hemiplegia, often preceded by premonitory symptoms. Multiple lesions, especially involving the cranial nerves. Locomotor ataxy; iridoplegia; epileptiform convulsions in adult life, beginning locally.

(b) *Occasionally due to syphilis.*—Chronic myelitis; muscular atrophy; sclerosis of cerebral convolutions; subacute mania; the irregular form of general paralysis of the insane; neuralgia.

(c) *Rarely due to syphilis.*—Acute meningitis and myelitis; glossolaryngeal paralysis; cerebral hæmorrhage; chronic hydrocephalus; chorea; local muscular spasm.

(d) *Not due to syphilis.*—Spinal hæmorrhage; acute spinal meningitis; acute mania; melancholia; idiopathic epilepsy; hysteria (?), catalepsy; paralysis agitans; common form of torticollis; migraine; exophthalmic goitre.

2. *The evidence that the patient has syphilis.*—This evidence is considered in the chapter on Diagnosis, and need not be described in this place. But it may be pointed out, that the affections of the nervous system often occur, as many writers have noted, in patients in whom other constitutional symptoms have been absent. The evidence of syphilis is then reduced to the history of a primary sore, and even this, in some cases, is wanting, the patient having been unaware of the infection. In such a case the diagnosis must be made on the other evidence, and necessarily possesses, *ceteris paribus*, less certainty.

3. *The age of the patient.*—Strictly, this point is merely one element in the next question, the absence of other causes of nervous disease, for it depends on the fact that syphilis is potent at an age when other causes of nervous disease are comparatively inoperative. The chief syphilitic diseases of the nervous system are most common between twenty and forty-five years, at an earlier period than simple degenerative diseases, whether primarily neural or due to vascular changes. The frequency of the syphilitic diseases at this period of life depends on the fact that the primary disease is most commonly acquired between eighteen and thirty years, and that the nervous effects are usually produced within fifteen years of the infection. If a patient who presents symptoms which, from their character, may possibly be the result of syphilitic disease, is in this period of life, his age increases the probability that they are due to syphilis. On the other hand, after forty-five years of age, syphilitic affections become less frequent, both absolutely and relatively to other forms of disease. Hence, over forty-five, age *taken alone*, makes it improbable that the disease is syphilitic. But if other considerations make its specific nature probable, the fact of the advanced age does not materially lessen this probability. Syphilis may be acquired at any age. One of the clearest cases of syphilitic facial paralysis the writer has seen, occurred in an old man of seventy, who had had his first venereal sore a few years previously. The interval after infection before the nervous system suffers, may also be longer than fifteen years. This is especially true of the degenerative diseases—locomotor ataxy, sclerosis of the cerebral convolutions, &c. These diseases, then, constitute an exception to the rule given above. Age does not increase or lessen the probability that they are due to syphilis.

4. *The absence of other discoverable causes of the disease.*—As already stated, the question of age is part of this—advanced age involves the action of other pathological influences. At all ages, however, other possible causes may coexist with constitutional syphilis. The family history, the heart, and the urine should be examined in every case. But if we find another influence known to be capable of causing disease of the nervous system, we must always ask whether the symptoms correspond with the effects which it can cause. As an illustration of this, we may take heart disease, which often coexists with constitutional syphilis and complicates the question of the cause of the nervous affection. A patient, for instance, who has valvular disease of the heart, and has had syphilis, suffers from hemiplegia. If this came on gradually, it could not have been due to the heart disease, but was probably the result of the syphilis. But if it came on suddenly, it might have been the result of embolism from the heart, or

of thrombosis in a syphilitic vessel. In such a case the diagnosis may be a matter of great difficulty, sometimes an impossibility. We have to be guided on the one hand by signs of embolism elsewhere; on the other hand, by the additional indications of syphilitic intracranial disease such as premonitory cerebral symptoms supply.

Not long ago, a woman came under the writer's care for a paralytic attack, which indicated sudden occlusion of the basilar artery. She was fifty-five years of age, and although she had had syphilis years before, she presented no sign of recent mischief. She had a loud presystolic murmur and all the signs of mitral constriction—the valvular lesion most frequently accompanied by embolism. The balance of probability seemed to be clearly in favour of embolism. She died and at the post-mortem examination the basilar and one vertebral artery were found to be the seat of extensive and characteristic syphilitic disease, which had led to thrombosis. There had been no embolism.

If in these cases we have no history of the syphilis, the diagnosis is scarcely possible. The following case, though not completed by an autopsy, affords a most instructive illustration of the fact that premonitory symptoms due to the obstruction which precedes occlusion, point to arterial disease rather than to embolism.

A clergyman, a popular preacher in a fashionable watering-place, had, some months before being seen, a sudden attack of hemiplegia, which was preceded for a fortnight by severe one-sided headache. He had a loud aortic regurgitant murmur, and the hemiplegia was thought to be due to embolism. Some months later it was ascertained that the patient, when a young man, had had syphilis, and had suffered from nodes not long before the onset of the hemiplegia. This, with the severe headache before the attack, made it practically certain that the cause of the hemiplegia was syphilitic disease of an artery.

On the other hand, Dr. Jackson has recorded a case in which a man of advanced age, the subject of syphilis, had an attack of hemiplegia. He died, and the cerebral arteries were found to present both ordinary atheroma and syphilitic disease, and the cause of death was the occlusion of an artery, which was atheromatous and not syphilitic.

The presence of other causes of the symptoms presented by the patient besides syphilis should lead to the most careful search for other evidences of the action of either cause, and to the most careful scrutiny of the symptoms to discover characters which suggest the operation of the one rather than of the other.

5. *The effect of specific remedies.*—This indication, while sometimes affording most valuable information, has to be used with extreme caution in the case of diseases of the nervous system. The general rules to be observed in employing it are discussed in the chapter on Diagnosis. To be conclusive, the effect of anti-syphilitic remedies must be considerable, since some other diseases of the nervous system are benefited, to a slight degree, by their use. The greatest source of fallacy, however, arises from the tendency to spontaneous improvement presented by many morbid states of the

nervous system. The more acute the onset, the greater is the tendency to spontaneous recession of the symptoms, and it is in these cases that the greatest caution is necessary. Certain diseases, as chorea, usually improve after a time. If recovery while iodide was administered were regarded as alone constituting proof of the syphilitic nature of a disease, nine tenths of the cases of paralysis after diphtheria might be proved to be of syphilitic origin; it is indeed probable that this mistake has occasionally been made in cases in which the throat affection has been slight.

A special caution must be given against relying on the converse proposition, and inferring that because iodide and mercury fail to do good, the disease is not due to syphilis. It has been insisted upon already, and cannot be too often repeated that, in the immense majority of cases, the change in the nerve tissues to which the symptoms are due is not specific but simple—the effect of the syphilitic process in adjacent tissues. How far recovery of this nerve tissue can take place will depend on the degree of damage, its duration, and on the extent to which the removal of the syphilitic disease restores normal conditions of nutrition. Recovery is always more possible when the damage is from compression than when it is due to inflammation, and it is least so in the cases in which it is due to arrest of the blood supply. When occlusion of a syphilitic vessel has taken place, the disease of the wall may be practically removed by specific remedies, but this will not restore the circulation through the vessel if thrombosis has occurred in it, and the necrotic area of brain tissue which that vessel supplied has no better chance of recovery than in softening from senile thrombosis or embolism. It is thus only when symptoms are gradually developed, and especially when they are such as result directly from the pressure of growths, that the absence of benefit from the specific remedies is evidence against the syphilitic nature of the disease. The observer must not, however, be too hasty in drawing his conclusion. Improvement in these cases is usually speedy, but it is sometimes slow. Degeneration of nerve fibres may have resulted from the local damage, and may have progressed far from its starting place. Regeneration is a work of time, of weeks, and even months, and the removal of long-standing symptoms must not be expected at once, nor the attempt to obtain them speedily relinquished.

Prognosis.—The facts just mentioned have an important bearing on prognosis. The changes in the nerve elements on which the symptoms immediately depend are simple, not specific. The extent to which the symptoms will pass away under treatment, depends on the degree in which normal conditions of nutrition can be restored by the removal of the syphilitic disease. If this is

impossible (*e.g.*, in the case of the occlusion of an artery, by syphilitic disease and secondary thrombosis), the prognosis ceases to be influenced by the syphilitic nature of the initial lesion.

The prognosis will accordingly differ, in the several forms of syphilitic lesion.

It is the most favourable when the symptoms depend on the pressure and irritation produced by a syphilitic growth. Compression will arrest function long before it causes destruction of tissue, and, although partial degeneration may have taken place, regeneration is for a long time possible, and complete restoration of function may follow the removal of the source of compression, provided the symptoms are not of many months' duration. In meningeal inflammation, acute and chronic, the prognosis is also good, provided treatment be employed early. The symptoms depend partly on the extension of inflammation to the subjacent tissue, and partly upon the pressure of the thickened membranes. The latter may be removed, and the former will be recovered from, if it has not existed too long. The paralysis of cranial nerves which accompanies the meningitis usually passes away rapidly, and the mental disturbance more slowly. On the other hand, symptoms depending upon arrest of blood supply, softening from thrombosis in a diseased vessel, are little, if at all, influenced by treatment. As already stated, the removal of the disease in the wall of a thrombosed vessel does not restore the circulation through it. The wall undergoes cicatricial changes, contracts on the clot, and an impervious cord persists. The symptoms often lessen, and may even pass away, in the same manner as they may pass away when the vessel is plugged by embolism. A partial collateral circulation restores in part the supply of blood to the affected area. Other parts of the brain take on some of the function of that portion which is destroyed, but there is no reason to ascribe these results to the specific treatment. In other cases in which the affected artery is large and important, no treatment, however thorough, produces any appreciable improvement or accelerates any slow amendment that was taking place before the treatment was commenced. The prognosis in the affections which depend on an increase in the interstitial tissue and wasting of the nerve fibres, must also be very guarded. In the majority of such cases, whether the change is irregular and apparently inflammatory, or affects systems of structure, and probably begins in the nerve elements, specific treatment rarely effects any considerable improvement. It may ameliorate the condition a little, but usually leaves the patient much as before. Occasionally, however, marked improvement results, especially when treatment is adopted very soon after the

onset. Lastly, symptoms, clearly the result of syphilitic disease, sometimes increase in a manner which points to an increase in the syphilitic process although the patient is taking iodide and mercury. An instance of this is afforded by the case related on p. 220. Specific remedies lose their specific influence. In all such cases the prognosis must be very guarded.

The conclusion from this brief survey of prognosis is that it is only when the symptoms develope gradually and in such a manner as to indicate the presence of growth, isolated or diffuse, and are treated early, that the prognosis may be confidently favourable. In all other cases a much more guarded prognosis should be given than is commonly ventured on. Repeatedly, I have known medical men, and even medical science, brought into discredit because an absolutely favourable prognosis of early and complete recovery had been given as soon as the disease was discovered to be of syphilitic origin. When, in such a case, after months of treatment by iodide and mercury, the patient's state is unchanged, he is, not unnaturally, disappointed and even indignant.

Inherited Syphilis.—The subjects of the inherited disease suffer from affections of the nervous system, for the most part similar to those which occur in the acquired form. Meningitis, vascular disease, and growths, are all met with. Of the three, meningitis is the most frequent, and growths are the least frequent, and are much rarer than in the acquired form. The neural degenerative diseases are unknown in this form, but, on the other hand, there is some reason to believe that inherited syphilis is an occasional cause of functional diseases (chorea and idiopathic epilepsy), the relation of which to the acquired disease is very doubtful. The same variation in the time at which these diseases occur is seen in the inherited, as in the acquired disease, and it is increased by the fact, pointed out by Hutchinson,[1] that the stages of the inherited disease are often less separate than they are in the acquired form. As a rule, however, meningitis is the most common early symptom; vascular disease may occur early, or as late as the tenth or eleventh year. Growths are usually early. Functional diseases commonly occur between the seventh and fifteenth year.

Meningitis may occur during the first few months of life,[2] or may not be developed until the seventh year.[3] The pathological appearances are rarely seen in the early stage. When the inflammation has existed for some time the membranes are found to be thickened

[1] Hutchinson: Article, Constitutional Syphilis, in Reynolds' System of Med., vol. i., 2nd ed., p. 758.
[2] Barlow: Path. Trans., vol. xxviii., p. 287.
[3] Broadbent: Lancet. Feb. 21, 1874, p. 258.

and opaque, and commonly adherent. The thickening of the pia mater may go on to calcification. Vomiting, headache, and convulsions are the common symptoms, and the fits may persist after the active meningitis is over.

Vascular Disease has been met with in several instances. A diffuse change, thickening with opacity, without nodules, was found in a child one year old, by Barlow. In another case the small vessels were found to be shrunken and opaque, like white threads. The change was confined to the inner coat. The writer has met with well-marked syphilitic disease of many arteries in a boy aged eleven, who presented also characteristic traces of choroiditis. The disease of the arteries may cause thrombosis in them or may even lead to their rupture. This was the case in the boy just mentioned, who died from cerebral hæmorrhage. Sudden hemiplegia is not very uncommon in syphilitic children and is probably produced by arterial disease.

Growths in the brain are rare in inherited syphilis. Few pathological observations are on record, and it is not common to meet with symptoms suggesting their occurrence.

An instance has been reported by Dowse.[1] The patient, a girl 12 years of age, had suffered for two years from tubercular ulcerating eruption of the nose, causing loss of substance. She then suffered from headache, epileptic seizures, mental disturbance, optic neuritis, paralysis of the left fifth, and right sixth nerves. On the right side of the brain was a growth the size of a shilling, in the upper part of the parietal lobe, and on the left side two, one at the back of the parietal lobe, and one on the supramarginal convolution. They were not thicker than a two-shilling piece. The arteries of the base were thickened and opaque. The left fifth and seventh nerves were thickened, swollen, and of a tough but gelatinous character. The father admitted having had syphilis.

Growths upon nerves are very rare, but a remarkable instance has been recorded by Barlow.[2] Nodules were found upon both third nerves, and on one of the fourth, fifth, sixth, seventh, and eighth nerves, near their origins. A similar change was found by Dowse in the case just described.

The spinal cord suffers in hereditary syphilis less commonly than the brain. I have lately seen a child, aged five years, who after having been hemiplegic since he was two and a half years old, has recently developed paralysis of the flexors of the ankle in each leg.

A curious case of transient paraplegia, in a subject of inherited syphilis, has been related by Keyes.[3] A boy in childhood presented all the signs of inherited syphilis. He had nodes on the tibia in the fifth year. On two separate occasions he had complete paraplegia, lasting each time only one day, and passing away without specific treatment.

[1] Dowse : Loc. cit., p. 71.
[2] Barlow: Path. Trans., vol. xxviii., p. 291.
[3] Keyes : Loc. cit., Case 37.

Epilepsy.—The organic diseases which result, in early life, from inherited syphilis, often cause convulsive attacks, which may recur for many years. The brain tissue which is not destroyed recovers imperfectly, and its nutrition is permanently altered and there results disordered action, of which the convulsions are one manifestation. In all cases of epileptic attacks in the subjects of inherited syphilis careful search should be made for traces of old hemiplegia, or for evidence that the convulsions are of such limited range as would suggest a local, and therefore probably organic cause.

An example of this is furnished by a girl aged nine, who came under my treatment for epileptic fits. She was the first child of the family which lived, two having previously been born dead. She presented characteristic teeth, traces of choroiditis, and, while under treatment, suffered from both keratitis and iritis. Her first fit was when she was four years of age, and the attacks had recurred frequently since that time. The convulsion was confined to the left side. The left arm was very weak: the weakness having come on gradually and being especially great in the extensors of the wrist. Under specific treatment the attacks ceased entirely. In this case there was certainly organic disease, probably a gumma on the surface of the right hemisphere.

The subjects of the inherited disease, with no sign of organic mischief in the brain, sometimes suffer from attacks in all respects resembling those of idiopathic epilepsy; which may commence after childhood is over. I have met with several examples of this kind, of which the following may be mentioned.

Mary H., aged twenty, single. Of seven brothers and sisters, six died under twelve months. The first two were still-born, and the patient was the third. Her teeth were stunted, and one central incisor was characteristically chisel-shaped and notched. The two outer incisors were also chisel-shaped, with a single notch, which in the left was small. At eighteen, she suffered from double keratitis. Both eyes presented choroiditic atrophy of the discs; outline not sharp; tint, dull uniform red; vessels small. She had one fit in infancy during dentition; no others till nineteen, when attacks commenced four months after some operation for diseased bone in the upper jaw; this had healed completely. The attacks were preceded by no warning; consciousness was lost, and the tongue bitten, the convulsion being bilateral. Under the use of bromide and iodide of potassium the fits ceased entirely.

Edward P., aged sixteen, had no neurotic family history. His father admitted venereal sores, followed by secondary symptoms—an ulceration of the nose, which had left symmetrical scars on the alæ nasi. The boy's central incisors presented a crescentic depression at the extremity on the anterior surface, but no actual notch. The boy had some fits at three or four years of age; no others till he was fifteen, when they recurred without known cause. Consciousness was lost, and convulsion was considerable, the tongue being bitten.

James M., aged sixteen, had no fits in infancy; the first occurred at thirteen years old, and they had recurred since about once a fortnight. They commenced by turning the head. Consciousness was lost completely. The patient's two central incisors were broken off. The corneæ presented the peculiar metallic reflection which is strongly suggestive of previous slight interstitial keratitis. Of the family, four children had died in infancy, and one was still-born without known cause; there was also a history of miscarriage early in pregnancy.

Such cases suggest that inherited syphilis predisposes to idiopathic epilepsy. It may be objected, however, that in these cases there may have been early organic brain disease, which had left no permanent symptoms except the convulsions. But in none of them was there a history or symptom suggestive of such organic disease. That in such cases there may be no organic disease, is proved by a case recorded by Dr. Hughlings Jackson.[1] The patient, an epileptic girl with well-marked inherited syphilis, died subsequently of typhoid fever, and no organic disease was found in the brain.

It is not uncommon to meet with epilepsy in the subjects of inherited syphilis, who present also neuropathic heredity. In such cases, the two diseases may possibly be merely coincident. But if there is reason to believe that inherited syphilis may alone lead to epilepsy, it cannot be denied a probable share of the causation in the cases which present a double heredity. The following are examples of the combination.

L. H., aged about twenty, had suffered, when seen, for three months from severe hystero-epileptic seizures, sometimes with loss of consciousness, sometimes without, and preceded by a sense of pain and weight at the top of the head. Her father died of phthisis; his brother was insane. The patient herself presented no indication of inherited syphilis; but her next older sister had most characteristic chisel-shaped and notched incisors. Several other children had died in infancy; and one brother, who died at nineteen, suffered from epilepsy.

In the following case, the convulsive attacks began at a very early period; but there was no indication of organic disease.

Susan F., aged eight. Her mother's uncle and aunt suffered from fits, and several brothers and sisters had fits during dentition. The patient had had a fit every month since the age of six months, when the first occurred without known cause. Her second incisors were not cut; but both corneæ presented traces of opacity, and the tonsils and soft palate were scarred.

Idiocy.—The development of organic changes in the brain of subjects of the inherited disease is often attended by general damage to its nutrition and rapid failure of mental power. Sometimes the mental failure occurs without any evidence of organic disease, as in the following case:—

A child aged seven was brought with the following history. She was well until nine months before, and then gradually became restless, mischievous, and irritable. When seen, she was constantly talking, though rarely so as to be understood. Sometimes she would pull her own hair off, and often try to hurt other children. Scars radiated from the angles of the mouth. The state of the teeth was very instructive. Upper left middle incisor well formed except near the edge, and then thin and irregular, the anterior aspect of the thin part being a little hollow. The right middle incisor was slightly narrower at the cutting edge than elsewhere, and at the edge there was a slight discoloration in the shape of

[1] Hughlings Jackson: Nervous Diseases in Inherited Syphilis, St. Andrew's Med. Graduates' Association Transactions, Case 8. (Reprint, Churchill. 1868, p. 21.)

the outline of a notch, as if a notch could easily be broken out. One lower incisor has a characteristic notch. The mother gives a history of syphilis communicated from her husband.

Inherited syphilis however can rarely be traced as a cause of congenital idiocy. Dr. Fletcher Beach has informed the writer that at the Darenth Asylum not more than one per cent. of imbecile children present signs of inherited syphilis. Of 220 female idiots at Leavesden, who were probably imbecile from birth, Mr. Mercier could only trace syphilis in five.

Chorea.—Chorea has been occasionally although rarely met with in the subjects of inherited syphilis. That it is not very common may be inferred from the fact that of eighty cases of chorea carefully examined by Dr. Hughlings Jackson,[1] only one presented signs of inherited syphilis. The following is an instance of the combination, and an example of the form which the writer has termed 'paralytic chorea,' in which the uselessness which always accompanies chorea, is greatly in excess of the movements.

The patient, aged 14, was brought to the Hospital for Paralysis and Epilepsy with the description that he "had lost the use of his left arm." It hung by his side apparently paralysed, but movements could be executed although without much force. On watching it closely, an occasional choreic twitch could be seen in it; there was no cardiac murmur. A few weeks later the choreiform movements were more distinct. The lad presented cicatrices radiating from the angle of the mouth, one incisor was notched and narrow at the edge, and there were cicatrices upon the uvula.

Dr. Hughlings Jackson has recorded[2] the case of a lad, who at the age of $8\frac{1}{2}$ had an attack of left hemichorea, and at 10 left hemiplegia. He has also described another case of chorea in a syphilitic family, in which one member suffered from chorea, and others from epilepsy. The mother, however, had had two attacks of chorea, and as the patients presented also a tendency to acute rheumatism, the relation of the chorea to the syphilis is doubtful.

Dr. Alison, in the paper on "Syphilitic Chorea" already quoted, describes two cases of chorea in inherited syphilis. The evidence of the relation between the two diseases is, in several of the recorded cases, insufficient.

Other forms of clonic spasm in the subjects of inherited syphilis are very rare. I have met with one case in which such spasm affected the whole of one side.

The patient was a boy, aged 16, who presented characteristic teeth and old double choroiditis. The spasm began at the age of fifteen as clonic twitching in the right shoulder, which gradually spread until it involved the whole right arm, and to a less extent the right leg, and even occasionally the face. In the upper arm the clonic spasm was constant and violent; when he tried to execute any movement the arm was thrown about wildly. Treatment had little influence upon it.

[1] Hughlings Jackson: Journal of Mental Science. Jan. 8, 1875.
[2] Hughlings Jackson: Trans. of St. Andrew's Med. Graduates' Association, vol. i. 1868.

Diagnosis.—The diagnosis of the diseases of the nervous system which result from inherited syphilis is a more simple matter than is that of similar affections in the acquired disease. We are not able, at present, to infer much regarding their syphilitic origin from the character of these diseases. The evidence of their causation rests mainly upon the discovery of the signs of inherited syphilis, or upon a history, personal or marital, of the disease in the parents. It is customary to refer all nervous diseases occurring in the subjects of inherited syphilis to this disease. Doubtless the custom involves a certain error. Organic diseases of the brain occasionally occur in children who are not syphilitic, and no doubt in rare instances do so in the subjects of syphilis though there be no direct connection between the syphilis and the nervous affection. At present we are not always able to discriminate between the effects of simple and of specific processes. Sudden hemiplegia, for instance, occasionally occurs in young children from thrombosis of a healthy vessel. Precisely similar symptoms may occur from thrombosis of a syphilitic vessel. But since organic diseases are vastly more common in syphilitic than in healthy children, we are justified in saying, in any given case, that the symptoms are probably due to syphilis, if there are signs of the inherited disease. The occurrence of multiple lesions however helps us here as it does in the acquired form. So also does the gradual development of symptoms. On the other hand, there are some diseases, such as infantile paralysis, which are not known to occur with special frequency in the subjects of syphilis, and so are probably not related to it.

Prognosis.—The prognosis in the affections of the nervous system in inherited syphilis is not favourable. Treatment is rarely prompt, and the development of the nervous system receives a permanent check from causes which would affect that of an adult but little. Growths, the lesions most amenable to treatment, are rare. Vascular disease is probably frequent: at least the symptoms of sudden thrombosis are common, and this lesion is, as already stated, almost entirely beyond the reach of specific remedies. Moreover, chronic meningitis, a frequent lesion, appears less influenced by treatment, and to cause more persistent injury to the brain, than in adults. In sudden paralysis, then, the prognosis must be most guarded: in gradual paralysis, and convulsive affections, and paralysis of nerves, the prognosis may be more favourable, but less so than in the corresponding affections in acquired syphilis.

SYPHILIS.

CHAPTER IX.

THE EYE AND ITS APPENDAGES.

(Revised by Edward Nettleship,* F.R.C.S.)

The Eye may be affected by syphilis in various ways. Indirectly by syphilitic disease of the walls or cellular tissue of the orbit; directly by disease of the structures of the eyeball itself. The movements and functions of the eye may also be interfered with to a greater or less extent through paralysis of one or more of the nerves supplying the eyeball or its muscles, as has been explained in the preceding chapter.

The Orbit.—Periosteal swellings, if small, or confined to the front of the orbit, may occasion no displacement of the eye, and the pain they cause may at first be referred to the eyeball. When extensive, or occurring deeply in the orbit, periostitis usually causes displacement of the eyeball; as in two cases reported by Poland.[1] Similar instances have been recorded by Gregoric,[2] Galezowski[3] and many others. Syphilitic affections of the periosteum or bone occasionally excite inflammation and suppuration of the cellular tissue surrounding the eye. Protrusion or even destruction of the eyeball may thus be produced, or sinuses may form from which discharge may continue for an indefinite period. Eventually cicatricial contraction of the tissues may produce eversion or other distortion of the eyelids, and more or less impediment to the movements of the eye. In such cases the constitutional disturbance is sometimes great, and death may result from extension of the inflammation to the meninges of the brain, or

* The portions of this chapter which are placed within brackets have also been added by Mr. Nettleship.

[1] Poland: Ophth. Hosp. Reps., ii., p. 223.

[2] Gregoric: Quoted in Nagel's Jahresbericht der Ophthalmologie für 1871, p. 393.

[3] Galezowski: Rec. d'Ophthalmologie. 1879, p. 449.

from septicæmia. In the following case severe syphilitic inflammation occurred in the soft structures at the lower and outer part of the orbit, and involved some of the muscles near their attachments to the globe.

[George R., æt. 40, admitted in August, 1874, with very extreme œdema, confined to the lower half of the conjunctiva of the right eyeball, of five weeks' duration; there was general congestion of the conjunctiva, and a little mucopurulent discharge. Close to the outer canthus were two little subcutaneous swellings, one of them movable. Three months previously the tongue had been sore, and there had been swelling of the right cheek and stiffness of the jaw; these were succeeded by the ocular symptoms. No abscess had formed. A week after admission the upper lid began to swell, and much pain, chiefly nocturnal, was present in the forehead and back of the head. There were now slight general haze of the retina and œdema of its lower part; vision, 4 Jaeger and $\frac{20}{30}$, refraction (except at the lower part), myopic, tension normal. In the other eye the vision and refraction were normal. It was now ascertained that the patient had had a venereal sore, followed by a rash, twenty-two years before; the scar of the sore was still visible. There was old disease of the right testis with sinuses, and the scar of an ulcerated node on the right tibia, dating from one year previously. Under iodide of potassium and mercury the pain and conjunctival œdema quickly ceased; sight became perfect, and the myopia gave place to normal refraction. But for three months some thickening remained about the insertion of the internal rectus muscle, and along the course of the inferior oblique; and a wide divergent squint came on, that was subsequently remedied by operation. Post mortem, after gangrene of the lower extremity from plugging of the right common iliac artery, the right orbit showed only doubtful increase of fibrous tissue.]

Galezowski[1] records a case of gummy inflammation in Tenon's capsule in the form of an annular growth involving the thickness of the eyelids and causing proptosis; it was cured by specific treatment.

The Lacrimal Apparatus.—Inflammation of the lacrimal passages, leading to obstruction, is occasionally a consequence of inflammation extending from the nasal mucous membrane. Lacrimal stricture and its consequences may also be caused by syphilitic disease of the bony walls of the nasal duct. Lagneau *fils*[2] has collected ten such cases, and R. W. Taylor[3] mentions a case in which a node of the ascending process of the superior maxilla caused compression of the lacrimal sac, and another in which the scar following an ulcer consequent on diseased bone caused deformity of the eyelids and epiphora. Richet[4] records an instance of fistula of the lacrimal sac following syphilitic periostitis. Hutchinson[5]

[1] Galezowski: Rec. d'Ophth. 1879, p. 449 (Case iv.).
[2] Lagneau *fils*: Maladies syphilitiques consecutives des voies lacrymales. Arch. Gén. de Méd. 1857, i., p. 536.
[3] R. W. Taylor: Amer. Journ. Med. Sci. 1875, p. 365.
[4] Richet: Gaz. des Hôpitaux. Oct., 1878.
[5] Hutchinson: On certain Diseases of the Eye and Ear, consequent on Inherited Syphilis. 1863, p. 190.

has observed three cases of inflammation of the lacrimal sac in children the subjects of inherited syphilis.

[A Frenchman, aged forty-five, with numerous deep adherent scars of former syphilitic ulcers on the scalp and in the palate, was under my care in 1879 for epiphora from lacrimal stricture on the right side. There was ozena, with dusky redness and thickening of the parts over the lacrimal sac and on the contiguous part of the nose, and bare bone in the nasal duct. The duct on several occasions would only admit a small probe with difficulty; but the epiphora, ozena, and external thickening disappeared almost entirely when iodide of potassium had been administered for several weeks.] [1]

Two cases of *gummy infiltration of the caruncles* are reported by Taylor.[2] Both men had shown symptoms of constitutional syphilis several years before; and in both cases the caruncles were swollen, firm, and of a deep red colour, but there was no ulceration. In one the caruncle was removed by an oculist, under the impression that it was a cancer; in the other the swelling disappeared under anti-syphilitic treatment, but complete atrophy of the caruncles followed with permanent epiphora.

Lacrimal gland.—Chalons[3] of Luxembourg has reported a case of enlargement of this gland, which he attributed to syphilis. A syphilitic man had successively enlargement of the lymphatic glands, iritis, coryza, and swelling of both lacrimal glands. The swelling became by degrees so considerable that a projection was formed at the outer side of each eyeball, but more marked on the right than on the left side. The upper lids were somewhat reddened. On palpation the border of the swollen gland could be felt, but there was no interference with its function and no pain, only a slight sensation of pressure and tension. Under mercurial inunction the patient speedily recovered.

The Eyelids.—It has already been mentioned that the eyelid is occasionally the seat of the initial lesion of syphilis. The border of the lid is its most frequent seat, especially near one or other commissure. Galezowski[4] records five cases where the lesion involved both the cutaneous and conjunctival surfaces of the lid. Mackenzie,[5] Ricord,[6] Vose Solomon,[7] Hulke,[8] de Wecker,[9] and other authors have also recorded examples. In such cases, the induration often extends rather widely; or an ulcerating papule may

[1] See also Chapter xii., p. 317.
[2] Taylor: Loc. cit.
[3] Chalons: "Adenitis Lachrymalis Syphilitica," Preuss. Vereins-Zeitung. 1859. Quoted by Lancereaux, loc. cit., p. 386.
[4] Galezowski: Maladies des Yeux. 1872, p. 245.
[5] Mackenzie: Diseases of the Eye. 1830.
[6] Ricord: Lettres sur la Syphilis. 1863.
[7] Solomon: Brit. Med. Journal. 1863.
[8] Hulke: Med. Times and Gaz. 1876, vol. liii., p. 463.
[9] De Wecker: Traité des Mal. des Yeux, 2nd ed., vol. i., p. 177.

form among the lashes with discoloration of the neighbouring skin, swelling and congestion of the conjunctiva, and lacrimation. The preauricular, and usually also the submaxillary glands are much enlarged. [I have had two cases of well-marked hard chancre on the eyelid under my own care, and have seen several others at the Moorfields Hospital.]

The eyelid may be the seat of papular and ulcerating syphilides, and the cilia may fall as a part of the general alopecia that accompanies the early cutaneous affections.

Mucous patches are occasionally seen on the mucous surface of the eyelids, and present much the same appearance as mucous patches elsewhere. A case reported by Després[1] as an initial lesion was probably one of this kind, since the affection was not noticed until *after* the appearance of mucous patches on the genitals.

Ptosis, from paralysis of the levator palpebræ, often occurs in cases of syphilitic paralysis of the third nerve, but seldom without implication of some other of the ocular muscles.

Circumscribed gummata occasionally form in the skin or subcutaneous tissues of the eyelid, and give rise to more or less diffused swelling and redness. When such gummata ulcerate, a considerable surface of skin may be destroyed, and even the tarsus[2] may be invaded, and deformities of the border of the lid be produced. Several cases of syphilitic ulceration of the eyelids have been recorded by Bull.[3] The lids may also be affected by the extension of serpiginous ulceration from the cheek, the nose, or the forehead.

The Tarsus may be attacked by gummy infiltration (syphilitic tarsitis, gummy tarsitis). The disease is a rare one, about a dozen cases having been recorded by Michel,[4] Magawly,[5] Bull,[6] Falchi[7] of Turin, and others. It usually consists of a chronic infiltration of the tarsus alone, the skin remaining free; the swelling may reach the size of a pigeon's egg (Magawly).

In Bull's case, the patient, a man æt. 27, came under observation in November, 1877. He had had syphilis four years previously. Six weeks before coming to Dr. Bull, the left lower eyelid became enlarged, heavy, and red, but there was no pain. On examination, it was found to be much swollen, forming a tumour as large as a robin's egg, hard, solid, and painless; the conjunctiva

[1] Després: Gaz. des Hôpitaux. 1866, No. 11.
[2] ["Tarsus" seems preferable to "tarsal cartilage," since no real cartilage exists in this structure.]
[3] Bull: New York Med. Journal. March, 1878.
[4] Michel: Graefe u. Saemisch's Handbuch der Augenheilkunde, iv. 441.
[5] Magawly: St. Petersburg Med. Zeitschrift, B. xii. Quoted by Michel, loc. cit.
[6] Bull: New York Med. Journal. Sept. 1878, p. 272.
[7] Falchi: Presse Méd. Belge. Juin 8, 1879.

was somewhat reddened. Under mercury and iodide of potassium the swelling began to soften, and in six weeks it disappeared, but the eyelashes dropped out.

The disease is usually unsymmetrical, but in one of Fuchs's[1] three cases it occurred in both upper lids. It is generally painless, and extends over a period of several weeks or months, but in one case it was acute and painful. Tarsitis comes on for the most part several years (four to eight) after the primary disease; though in one case it has been observed to be present with the initial lesion and skin eruption.

The Conjunctiva.—The initial lesion is on rare occasions found on this membrane.

Dietlen[2] describes an initial lesion on the ocular conjunctiva of the left eye of a physician infected on October 4th. On November 2nd there was redness, swelling, and increased mucus; on 15th considerable swelling on the lower half of the ocular conjunctiva, but nothing more. On 29th the swelling had greatly increased, had spread to the upper part of the ocular conjunctiva, and was of a peculiar pinkish colour. The lower tarsus was enlarged and dense, and at the upper margin of the orbit was a painless swelling under the skin as large as a pea. A lymphatic gland as large as a bean was felt over the parotid. The tarsus swelled still more, and on December 4th roseola appeared. No mention is made of ulceration of the swollen conjunctiva.

[The following case came under my care.—Alice H., three years, was brought on August 14, 1877, on account of a swelling of the left lower lid, which her mother had noticed for about a month. An ill-defined swelling was visible at the outer part of the lower lid, free from pain or redness, and not involving the skin or subcutaneous tissues. Felt through the skin it was quite firm, but it was too far from the border of the lid and too large, to be a meibomian cyst, large enough indeed to cause some difficulty in everting the lid. When everted, the palpebral conjunctiva showed in the sulcus a large, palish, abruptly defined patch of thickening, the surface of which was nearly smooth; when pinched up it had the characteristic gristly feeling of a hard sore. There was indolent enlargement of the glands in front of the ear and below the jaw, but no secondary symptoms. August 18th, induration less. On 21st, a dusky papular eruption had appeared on the trunk, and persisted for two months.]

Desmarres,[3] has also reported two cases; while Sturgis,[4] Bull,[5] Boucheron,[6] and others, have recorded examples of the same kind.

Later affections of the ocular conjunctiva and sclerotic are somewhat less rare. Papules,[7] mucous patches and ulcers have been seen. But the commonest form of disease seems to be a *gummatous*

[1] Fuchs: Klin. Monatsblätter f. Augenheilkunde. Jänner, 1878. Quoted by Bull, loc. cit.
[2] Dietlen: Casuistische Beiträge zur Syphilid. des Auges. Rostock, 1876 (abstracted in Virchow and Hirsch's Jahresbericht f. 1876, 457).
[3] Desmarres: Mal. des Yeux. 1855, vol. ii., p. 213.
[4] Sturgis: Amer. Journ. Med. Sci. 1872, p. 102.
[5] Bull: Amer. Journ. Med. Sci. 1878, p. 407.
[6] Boucheron: L'Union Médicale. April 1, 1879.
[7] Savy: Thèse de Paris. 1876.

infiltration of the conjunctiva, often extending into, or sometimes commencing in, the submucous tissue, or the superficial portion of the sclerotic. It occurs either in separate spots, or in larger patches formed by the confluence of nodules. A semitransparent pale coppery patch, as large as a silver penny, was observed by Smee,[1] near the cornea of a woman who had had syphilis two or three years before. Cases of syphilitic disease of the conjunctiva, for the most part of the above type, have been recorded by France,[2] Desmarres,[3] Estlander,[4] de Wecker,[5] Bull,[6] Sichel *fils*,[7] Hirschberg,[8] Berger,[9] Brière,[10] and others. Syphilitic ulcers on the conjunctiva, whether of the lids or globe, are generally the result of the disintegration of patches of gummy infiltration, and consequently occur usually as late forms of syphilis.

Of the type described by Smee, France has given three cases with good coloured plates, in which the disease was more extensive than in Smee's case; in two of them the syphilis was acquired, in one (a child, æt. three years) inherited. The disease generally occurs close to the cornea, where the conjunctiva becomes thickened and glued down by an elastic semitransparent infiltration of a dull yellowish or reddish colour, and showing little or no increase of blood-supply. In some cases the growth forms quite a nodular rampart surrounding the cornea. These cases are closely related to the rarer instances of gummata upon the sclera, and are no doubt included under the heading of 'episcleritis' by some authors. In other cases the disease forms a single superficial nodule at some distance from the cornea, and moves freely with the conjunctiva. In at least four of the published cases, the disease occurred during the period of general eruptions; and in some others, where the primary lesion had occurred several years previously, the constitutional symptoms had been severe or protracted. Usually only one eye suffers. The disease is much more common in acquired than in inherited syphilis. [I have seen one or two mild cases in children several years of age.]

The growths are very chronic, and do not ulcerate unless removal be attempted by the knife.

Diagnosis.—The principal difficulty, when other signs of syphilis

[1] Smee: London Medical Gazette. New Series, vol. i., p. 347. (1844–5.)
[2] France: Guy's Hosp. Reps. 1861 (3rd Series, vol. vii.), p. 109.
[3] Desmarres: Loc. cit., 217.
[4] Estlander: Zehender's Klin. Monatsbl. 1870, p. 261.
[5] De Wecker: Traité des Mal. des Yeux, 2nd ed., i., p. 177.
[6] C. S. Bull: Loc. cit., p. 405, *et seq.*
[7] Sichel *fils*: Gaz. Hebdom. April 23, 1880.
[8] Hirschberg: Conjunctivitis Gummosa. Klin. Beobacht. 1874.
[9] Berger: Hirschberg's Centralblatt. 1878, S. 196.
[10] Brière: Ann. d'Oculist. 1874, t. lxii., p. 105.

are wanting, is to distinguish this disease from epithelioma of the conjunctiva and sarcoma of the sclerotic, and this difficulty, as in Wecker's case, may be very considerable. Several authors point out the peculiar translucency, the yellowish or brownish red tinge, and the absence of congestion, as marked characteristics of the syphilitic growth. In ordinary episcleritis the redness and pain are much greater, and the new growth is usually much less than in the former disease. Lastly, under specific treatment, the syphilitic growths invariably disappear.

Purulent ophthalmia is often seen in new-born syphilitic infants from contact with the vaginal discharge during birth. It has, of course, no connexion with syphilis. Hutchinson has seen many cases of muco-purulent ophthalmia beginning four or six weeks after birth in syphilitic children, which he considers to be of the same nature as the nasal catarrh, which is the cause of the 'snuffles' so common in inherited syphilis.

The Cornea.—By far the most important affection is the diffused form of inflammation known as *interstitial or parenchymatous keratitis.*

Interstitial keratitis is, according to Hutchinson,[1] always caused by syphilis, and nearly always by inherited syphilis; and most English observers agree with him. Abroad, however, syphilis is not yet looked upon as the sole, nor by some authors[2] even as the principal, cause of this disease.

Saemisch,[3] for example, states that, although he was able to prove inherited syphilis in sixty-two per cent. of his cases, he also finds keratitis of the same kind in persons who are not syphilitic. Out of fifty-one cases, Horner[4] found inherited syphilis certain in twenty-six, probable in ten, and acquired syphilis certain in two cases. De Wecker[5] states that two-thirds of the cases depend on syphilis. Förster,[6] though not going quite so far as Hutchinson, sums up in a sense decidedly favourable to that observer's view.

☞ [In a total of 214 cases of interstitial keratitis, evidence of hereditary syphilis, other than the corneal disease, was noted in 146 (68 per cent.). This number was made up as follows:—A. Evidence of syphilis in parents before birth of patient, 17; B. evidence of hereditary syphilis in other members of the family (excluding group A.), 14; C. evidence in the patient, other than keratitis (excluding groups A. and B.), 115; characteristic teeth, 69; evidences in physiognomy, bones, skin, palate, or choroid, 46.

[1] Hutchinson: Oph. Hosp. Rep., vols. i. and ii.; and also, "On certain Diseases of the Eye and Ear, consequent on Inherited Syphilis." 1863.

[2] Hock (Vienna) in Nagel's Jahresbericht f. 1876, p. 227; and compare C. S. Bull in Amer. Journ. Med. Science. 1877, p. 66.

[3] Saemisch: Graefe und Saemisch's Handbuch d. Augenheilkunde. 1875, vol. iv., p. 264. See also Galezowski: Mal. des Yeux. 1872, p. 288.

[4] Horner: Quoted by Saemisch, loc. cit.

[5] De Wecker: Ocular Therapeutics, translated by Litton Forbes. 1879, p. 124.

[6] Förster: Graefe und Saemisch's Handbuch, vii., Part I.

In the remaining sixty-eight cases (32 per cent.), though inheritance of syphilis was not proved, there was, almost without exception, strong suspicion of that disease apart from the keratitis.

The condition of the permanent central upper incisors was noted in 138 of the cases :—of these, they were 'typical' in seventy-three (53 per cent.), 'suspicious' in thirty-four (24 per cent.), and normal in thirty-one (23 per cent.); in fifteen cases the permanent teeth had not been cut; and in the remaining sixty-one, the state of the teeth was not recorded.]

Diffused interstitial keratitis occurs now and then in cases of acquired syphilis. Such cases are mentioned by Horner,[1] Galezowski and others. Hock,[2] Demarbaix,[3] and others refer to a localised keratitis complicating certain cases of iritis at a late stage of acquired syphilis. Hutchinson[4] has referred to and carefully examined an extremely severe case under the care of Wordsworth.[5]

The patient was a married woman, æt. 25, who, during the period of general eruptions, suffered from double interstitial keratitis, with formation of vessels in the cornea. The attack was of long duration and ended in blindness.

[In the two following cases the keratitis precisely resembled that of inherited syphilis.

Interstitial keratitis of one eye late in the secondary stage of acquired syphilis.—Elizabeth K., 25, single, admitted Aug. 8, 1879, with diffuse inflammation of the right cornea. The eye had been bad a week. The cornea was in a state of general 'ground-glass' haze, the pupil active; much photophobia. Atropine ordered. On 19th, cornea steamy, haze mottled, but no abrupt dots, no iritis; "indistinguishable from mild heredito-syphilitic keratitis." The left eye a little congested. A large inflamed cellular node was now present over right tibia, where she had had a blow three weeks before. It was now ascertained that she had had a sore on the genitals a year previously, followed by a bad throat and tongue (for which she had been admitted into the venereal wards), and that later, an eruption had appeared on the hands, which was diagnosed as 'psoriasis.' There were no signs of hereditary syphilis. She was ordered blue pill and iodide of potassium. Sep. 4th : Cornea as before. The centre of the node on the shin has sloughed out, and the cavity is healing under black wash. 15th : Right cornea clearing at the upper part and the eye quieter. The left eye shows slight ciliary congestion at the inner part. A few days later she was discharged for misconduct and was not seen again.

Unsymmetrical keratitis several years after acquired syphilis.—Eliza F., 52, admitted in June, 1876, for diffuse keratitis of the right eye only; cornea hazy all over, but more densely in some parts than others; no ulceration. No previous attack. The disease had lasted at least five months. Six years before admission she had had a sore throat, and a number of ulcers on the forehead and right temple, which had left large, irregular, deep scars, concerning the syphilitic nature of which there could be no doubt.]

Nevertheless interstitial keratitis is a disease almost peculiar to childhood and early adult life. It is most common between the ages

[1] Horner : Quoted by Förster : Graefe und Saemisch's Handbuch, Bd. vii., i., p. 59.
[2] Hock : Nagel's Jahresbericht f. 1876, p. 227.
[3] Demarbaix : Gaz. des Hôp. 1870, p. 303.
[4] Hutchinson : Path. Trans. 1876, p. 352.
[5] Wordsworth and Morton : Ophth. Hosp. Reps., ix., p. 51.

of eight and fifteen; the average age being about ten years. Hutchinson[1] has seen it in a child of two years old; on the other hand, it may occur in an adult who has been free from symptoms of syphilis since infancy; or even, according to the same author, in one who has never had any symptoms before.[2]

[In 195 cases the keratitis began at or under four years of age, in 15; between five and fifteen years, in 110; between sixteen and twenty years, in 34; between twenty-one and twenty-five years, in 18; and between twenty-six and thirty-five years in 18.]

Interstitial keratitis usually begins in one eye. When the case is first seen one or more considerable patches of haze in the substance of the cornea are generally present, together with considerable ciliary congestion, and more or less intolerance of light. The haze may begin at any part, but most frequently near the margin. Before long the whole cornea becomes involved; and in a few weeks the various clouds of opacity have so thickened and extended, that the whole cornea is opaque, though the greater density of certain parts is still quite perceptible. From the beginning the hazy parts lose their polish through some change in the anterior epithelium, and this, together with the opacity, gives to the cornea very much the appearance of a piece of ground-glass. There is no ulceration. In a few cases, although the cornea is severely affected, there is a total absence of congestion and photophobia; but in the great majority, a zone of sclerotic congestion is present in the ciliary region, and some intolerance of light with circumorbital pain. It is sometimes observed that the appearance of corneal opacity is preceded for a few days by ciliary congestion. In certain cases the opacities are much smaller and more sharply defined than usual (a variety of keratitis punctata), but even in such the intervening tissue is seldom quite clear.

In another group of cases the haze of the cornea is accompanied from the first by the formation of vessels in its substance. These may begin as fringes or crescents at the upper and lower borders; or irregular or sector-like patches of vascularity may appear at any part of the cornea; sometimes the groups appear to be insular, but are in reality fed by one or two larger vessels which can be traced to the deeper marginal layers. The vessels are small, nearly straight and very close together, and, owing to the opalescence of the corneal tissue covering them, the groups have a dull red colour (salmon-pink or dull brick-red). In extreme cases the vessels invade every part of the cornea, except a little island at the middle. During

[1] Hutchinson: On certain Diseases, &c., p. 116.
[2] Hutchinson: Path. Trans. 1876, p. 354.

recovery a few straggling vessels are often left, and the corneal surface may show numerous little irregularities.

Iritis is a not infrequent complication of interstitial keratitis the disease then becoming 'kerato-iritis' or 'corneo-iritis.' [Iritis was noted in fifty of 214 cases, or about 23 per cent.; this of course is the minimum.] The iritis is often slight and appears to be never attended by the formation of nodules, but posterior synechiæ are often formed.

Cyclitis, or anterior choroiditis, is denoted by the development and persistence of intense purplish injection of the ciliary zone with severe pain and photophobia and usually severe iritis. The corneal affection is sometimes comparatively slight. Cyclitis when severe leads ultimately to thinning of the anterior part of the sclerotic with elongation of the front of the eye, or sometimes to partial staphyloma. Secondary glaucoma[1] is not very rare during or after an attack of keratitis with cyclitic symptoms. Posterior choroiditis (C. disseminata) is also often present, [forty-three times in 214 cases—thirteen times with, and thirty times without, evidence of iritis] and opacities are sometimes found in the vitreous.

Ulceration is extremely rare as a complication of interstitial keratitis. Hutchinson has scarcely ever seen it, and other oculists remark on its great rarity. [Ulceration occurred in only four of 214 cases, and in three of these, the children showed evidence of struma in the nose, lips, or cervical glands. Such signs of struma were recorded in only ten of the entire series.]

The pain and intolerance of light in interstitial keratitis vary, generally in direct proportion to the congestion; but there is no fixed relation between the severity of these three symptoms and the density of the corneal haze. Both eyes are rarely attacked simultaneously; but after an interval, varying between a few days and two months (in one of Hutchinson's cases it reached two years), the second eye is usually attacked and goes through the same stages. At the climax of the disease both corneæ are often, for several weeks or months, so far opaque that the patient can only distinguish light from darkness; after this, the cornea first affected begins to clear. The affection is generally of the same type and of about equal severity in both eyes. As to symmetry, Hutchinson[2] found both eyes affected in ninety-one of 102 cases.

Relapses occur sometimes, but are exceptional, and the second attack is seldom so severe as the first; [relapses, more or less marked, were noted in about 5 per cent. of a series of 214 cases.]

[1] Graefe: Quoted by Saemisch, loc. cit., p. 266. An example of glaucoma secondary to keratitis and choroiditis is recorded by Nettleship: Oph. Hosp. Reps., vii., p. 204.

[2] Hutchinson: "Certain Diseases of the Eye and Ear," &c., p. 123.

The Duration of the disease varies much in different cases. Usually it lasts from six to twelve months, but in severe cases it may extend over a longer period, even several years. [The mildest and shortest attacks are seen in children under five years of age.]

The Diagnosis is generally very easy. In a well-marked case, the universal ground-glass appearance, or the dull salmon-red tint of the cornea, can hardly be mistaken, especially if both eyes are affected. The tendency to spontaneous disappearance is also characteristic. A history of syphilis either in the parents, in the patient himself, or in his brothers or sisters, can very often be ascertained on enquiry; and the patient will, in a large proportion of cases, present indications of syphilis, in his teeth, or physiognomy, or in the presence of choroiditis, deafness (without otorrhœa), or disease of the palate or other bones, with other peculiarities that denote syphilis.

[There is sometimes difficulty in distinguishing this disease from a form of non-syphilitic relapsing cyclitis with corneal opacities and iritis. The latter is generally a disease of adult life, often for a considerable time confined to one eye and characterised by its inveterate tendency to recur, each successive attack usually leaving the eye rather worse than before. The corneal opacities in this disease are more abruptly defined and much more limited to the marginal parts, the cornea not being as a rule uniformly and universally hazy as in the syphilitic keratitis. Dusky thinning of the sclerotic, which is rare in syphilitic keratitis, is generally seen in severe cases of the non-specific disease.]

The Prognosis is favourable in mild cases; indeed it is very good if the case be early brought under treatment, and if the ciliary irritation and photophobia be not severe. In such cases, under suitable treatment, the cornea regains perfect transparency and its epithelium becomes smooth and bright again; but in many, a slight degree of diffused haze remains permanently and causes proportionate damage to vision. Except in mild cases, the prognosis should always be guarded; for when the corneæ have cleared, we may find the pupils partially occluded from iritis, or extensive choroiditis disseminata may be detected. The occasional appearance of secondary glaucoma has already been mentioned. If severe intolerance of light remain for many weeks or months the prognosis is unfavourable.

The Iris.—Syphilis, according to von Graefe,[1] is the cause of sixty per cent. of cases of iritis from all causes: Hock[2] estimates the pro-

[1] v. Graefe: Deutsche Klinik. 1858, S. 208.
[2] Hock: Loc. cit.

portion to be at least 50 per cent., and Mauthner[1] is of opinion that syphilis is the commonest of all causes of iritis (omitting traumatic cases). Hirschberg,[2] however, in a statistic including 400 cases, returns only 37 per cent. as syphilitic. Of seventy-one cases of iritis from various causes noted by Nettleship[3] thirty occurred during secondary syphilis.

Syphilitic iritis occurs by far most frequently in the exanthematous stage of the malady; [in forty-six cases where the interval between the primary disease and the onset of the iritis was approximately known, it was two months or less in seven; between three and six months in twenty-five; between seven and twelve months in twelve; more than twelve months in only two cases.]

In syphilitic persons iritis appears under two leading forms; one similar in most respects to iritis from other causes, the other distinguished by the presence of minute gummata. Distinct gummy nodules are not found in a large proportion of the cases. Schmidt[4] states that he saw nodules in seven of forty-seven diseased eyes in thirty-four persons. [In 149 eyes of 101 patients nodules were present in fifteen eyes.]

A degree of thickening of the whole substance of the iris at its pupillary border, without distinct nodules, is more common. But the tendency to plastic inflammation in syphilitic iritis is shown still more frequently by the presence of little dots on the back of the cornea at its lower part, or by slight haze of the cornea, and by marked muddiness of the aqueous; these features distinguish syphilitic iritis from the majority of the cases due to rheumatism.

Symptoms.—Syphilitic iritis, like most other forms, is preceded for a day or two by the well-known zone of pink congestion of the subconjunctival vessels in the ciliary region; this may extend to the whole visible part of the sclerotic, and involve the conjunctiva as well, though such intense congestion is more common in the rheumatic cases. The aqueous humour very early becomes turbid, in rare cases being converted into a semi-transparent gelatinous solid, though hypopyon is extremely rare in syphilis. The iris is discoloured and its tissue indistinct or 'muddy,' partly from congestion, partly from exudation into its substance; and often slight haze of the cornea, especially at its lower part, is evident enough, being caused mainly by the presence of numerous little well-defined dots on its posterior surface and deep in its substance. Unless promptly treated, adhesions soon form between the iris and

[1] Mauthner: Quoted by Manz in Nagel's Jahresbericht 1872, S. 221.
[2] Hirschberg: Beiträge f. Augenheilkunde. 1877—78.
[3] Nettleship: Brit. Med. Journ. 1876, ii., p. 617.
[4] Schmidt: Nagel's Jahresbericht 1872, S. 289.

the capsule of the lens, and the pupil from an early period loses its freedom of movement or becomes fixed, its area not infrequently becoming covered by greyish soft lymph. Vision is impaired in proportion to the turbidity of the various media.

If gummata form, the iris swells at one or more points, and small nodules appear projecting from its anterior surface, which are at first very vascular, reddish, and no larger than a pin's head, afterwards often larger and yellowish in colour. They are generally situated close to the pupillary border of the iris; occasionally they enlarge so much as almost to fill the anterior chamber, but they scarcely ever suppurate. Hewson[1] observed that the nodules were sometimes pendulous. [I have lately seen a case in which a nodule in the course of several days travelled from one part of the iris to another.] The structure of these growths is similar to that of gummata in the liver and elsewhere, as was shown by the examination of one by Alfred Graefe[2] and another by Neumann.[3] Under mercurial treatment they quickly disappear, but if they become very large, atrophy of the corresponding part of the iris may occur.

The congestion in syphilitic iritis varies very much, and bears no special relation to the amount of plastic exudation; indeed it is sometimes comparatively slight in the cases with nodules. Usually there is little or no pain in syphilitic iritis, and but little intolerance of light; but both symptoms may be very severe, the pain being even excessive in and around the eye. Severe pain is generally accompanied by copious congestion: but neither pain nor congestion is proportionate to the amount of structural change in the iris. It seems probable that both these symptoms are connected more with inflammation of the ciliary body than with inflammation of the iris itself, though the latter structure always participates more or less in the morbid action. The frequent occurrence of opacities in the vitreous during iritis, without the presence of any choroiditis which can be detected by the ophthalmoscope, shows that the ciliary body or the anterior part of the choroid is often also influenced. Thus, Schmidt[4] found complications, chiefly turbidity of the vitreous, in thirty-one of thirty-four cases. This opaque condition of the vitreous has been often ascribed to retinitis without sufficient reason; syphilitic retinitis, except as a consequence of choroiditis disseminata, being certainly a rare affection. So also, choroiditis disseminata though itself often preceded by iritis [in about 20 to 25 per cent. of the cases in my experience] can hardly be spoken

[1] Hewson: Venereal Ophthalmia. 1824, p. 14.
[2] Graefe: Arch. f. Ophth., viii., I., S. 288.
[3] Neumann: Graefe's Arch. f. Ophth., xvi., I., S. 69.
[4] Schmidt (Marburg): Berl. Klin. Wochenschr. 1872, ix., S. 23.

of as a frequent complication of the latter much more common malady. In some cases, however, syphilitic inflammation may be traced as it gradually extends backwards from the iris to the choroid, until the whole uveal tract is involved and a typical choroido-retinitis disseminata is produced.

Syphilitic iritis seldom begins in both eyes simultaneously, but both suffer sooner or later in about two-thirds of the cases. [Thus in thirty-four persons who had previously had syphilitic iritis, and who came under my care for other reasons, I found the iritis to have been double in twenty-two. But the proportion of those who have iritis in the second eye before that in the first has subsided, is smaller: thus in a total of 120 cases of syphilitic iritis, I found the disease bilateral in fifty-eight, or only 48 per cent., and Schmidt had only thirteen symmetrical in thirty-four cases. In three cases Schmidt found retinitis in one eye, and iritis in the other.]

Repetition of iritis after the cure of a first attack is rare, though fluctuations during its course are common. This is in marked contrast with the strong tendency to relapse possessed by the rheumatic form of iritis, in which the attacks are often repeated once or twice a year during long periods of time.[1] When iritis of syphilitic origin is repeated after an interval of cure, it will not unfrequently be found that the patient is decidedly rheumatic as well.

Differential diagnosis.—From the foregoing, it will be seen that the presence of turbidity of the aqueous, of opacities in or on the back of the cornea, and of flocculi in the vitreous in any case of acute iritis, points to syphilis as the probable cause; the discovery of undoubted diffuse retinitis (not mere congestion of the disc and retinal veins) or of choroiditis disseminata makes syphilis nearly certain; nodules on the iris are also all but conclusive. Symmetry of the attack and, in old cases, the history of a single attack years before without any subsequent relapses, point with much probability to syphilis as the cause. Rheumatic iritis often occurs first in one eye, then in the other, but seldom in both during the same attack.

Prognosis.—Iritis frequently ends in resolution if treated early and efficiently, but in a large proportion of cases, one or more permanent adhesions are formed between the iris and lens-capsule, and when there has been excessive formation of lymph complete closure of the pupil may occur. Damage to the nutrition of the lens itself is not common. Many cases are mild, and a large number recover without any damage to the tissues worth mentioning, and with perfect

[1] Hutchinson: Oph. Hosp. Rep.; and "Brain." 1878, Part I.

sight. Disease of the vitreous renders the prognosis less favourable, and the same is of course true of choroiditis and retinitis. In some few cases the disease is very protracted, but these are for the most part complicated with choroiditis or cyclitis.

Iritis in inherited syphilis.—Hutchinson[1] and others have described a form of iritis which attacks infants with inherited syphilis. It is a rare disease, and often escapes notice from the absence of ciliary congestion and the insignificance of the other local symptoms. In sixteen cases Hutchinson found that five months and a half was the most common age for it to begin; the latest age was sixteen months, the earliest six weeks. In nine, there was copious effusion, in three, moderate effusion, and in four, only tumidity and discoloration of the iris. In thirteen, the cornea remained clear. The iritis is generally accompanied by other signs of syphilis, is not more severe nor extensive in feeble than in robust infants, and is readily controlled by mercury. [In the cases of this form of iritis which are seen in ordinary eye practice, much damage has often been done by occlusion of the pupil and deeper mischief. Probably many of the slighter cases escape the notice of the parents, and are not brought to the surgeon.]

Cases of severe plastic iritis are occasionally seen in rather older syphilitic children. Hutchinson[2] has recorded four such in children between fifteen months and six years of age, and in two of them the eyeball was destroyed and excision was required. The relation of the eye disease to syphilis in this small group is hardly settled.

Syphilitic iritis may occur in intra-uterine life. Bull[3] has published an account of three cases in which he proved the existence of iritis within two hours of birth. In one of these the iris in both eyes was bound down to the capsule of the lens; in the other two the posterior synechiæ were confined to one eye. The iris in these cases was not discoloured, and nothing would have been noticed had not oblique illumination and atropine been employed. All three children had snuffles within a fortnight after their birth, and two were born with patches round the anus. Two of the mothers bore unmistakable signs of constitutional syphilis.

Deep Ophthalmia.—Syphilis, besides attacking the superficial parts of the eye, also causes inflammatory and consequent atrophic changes in the deeper structures; indeed, no part of the eye, unless it be the sclerotic of the posterior part of the globe, is exempt. Some of the changes are peculiar to syphilis, whilst others, though

[1] Hutchinson: Med. Times and Gaz. 1860, July 14; and Oph. Hosp. Reps., i., p. 191 and p. 226.
[2] Hutchinson: Oph. Hosp. Reps., viii., p. 217.
[3] C. S. Bull: Amer. Jour. Med. Sci. 1877, July, p. 69.

not peculiar to it, are of syphilitic origin. The choroid, ciliary body and retina are, next to the iris, most subject to syphilitic disease; the sclerotic is very seldom involved. The vitreous is very often, and the lens sometimes, seriously affected, but never except as the result of morbid action travelling to them from the uveal tract or the retina. The multiplicity of the structures attacked, either in the same eye or in its fellow, is a distinctive mark of syphilitic inflammation of the eye. Eyes are occasionally lost both from acquired and from inherited syphilis. In such cases there is severe inflammation of the whole uveal tract (irido-cyclitis, irido-choroiditis). Such destructive inflammation may be either distributed with tolerable uniformity over the whole tract, leading to detachment of the retina, partial shrinking of the eye, and sometimes to secondary cataract; or it may be centred in one part of the ciliary body, where a large gumma forms, perforating the sclerotic close to the cornea and leading to actual or virtual loss of the eye. The iris and choroid also participate, but to a less degree.

Von Hippel [1] describes the examination of an eye removed from a man who had been infected with syphilis two years before. A gumma projected from the sclerotic below the cornea and into the anterior chamber in the direction of the pupil; the lens and its capsule had disappeared. The same condition was well described by Hewson [2] as deep-seated abscess of the eyeball. He had seen three cases, and refers to two others by Saunders [3] and Farre. Other similar cases are also reported by Arlt,[4] Delafield,[5] Barbar,[6] Nettleship,[7] and Hutchinson.[8]

Cases of ciliary gumma may heal with extensive scarring of the sclerotic and deeper parts in the ciliary region, leaving almost complete blindness. Such a case is recorded by Baréty.[9] Schmidt (of Marburg) [10] reports two similar though less severe cases, in one of which recovery of useful vision took place. Bull [11] records a case where a large gumma of the sclerotic projected between the insertions of the superior and external recti muscles, and appeared in the interior of the eye as a dark brown mass, the size of a pea; the iris was free. Lastly, Loring and Eno [12] have reported another case

[1] v. Hippel: Graefe's Arch. f. Ophth., xiii., 65. 1867.
[2] Hewson: Venereal Ophthalmia. 1824, p. 20.
[3] Saunders: Diseases of the Eye. 1816, Plate I., Fig. 3.
[4] Arlt: Krankheiten des Auges, ii., 67.
[5] Delafeld: Trans. Amer. Ophth. Soc., iii., 69.
[6] Barbar: Nagel's Jahresbericht f. Ophth. 1872, 221.
[7] Nettleship: Ophth. Hosp. Reps., vii., 370, 374, 576, and 584.
[8] Hutchinson: Ophth. Hosp. Reps., vii., 42.
[9] Baréty: Nagel's Jahresbericht 1873, 281.
[10] Schmidt: Nagel's Jahresbericht 1872, 289.
[11] C. S. Bull: Trans. Amer. Ophth. Soc., ii., 195.
[12] Loring and Eno: Ibid., 174.

of gumma situated in the ciliary body, which came on five years after the primary disease.

The Choroid and Retina.—*Choroiditis* is the commonest deep-seated syphilitic disease of the eye ; but in acquired syphilis choroiditis is much less common than iritis. Notwithstanding the continuity of the iris and choroid, their pathological processes in syphilis are usually independent. [Of thirty-seven cases of choroiditis in acquired syphilis, iritis had occurred in only fourteen.] The inflammation, however, often spreads to the retina (choroido-retinitis), and to the vitreous, causing much damage, which may slowly increase for years. There are no material differences between the choroiditis of acquired and that of inherited syphilis; but in the latter, there is more tendency to proliferation of pigment and consequent formation of black spots. Choroiditis sets in generally in the secondary stage, though usually later than iritis. In thirty-eight cases, Galezowski[1] found the interval between the primary disease and the onset of choroiditis to be within twelve months in sixteen patients; between one and three years in thirteen, and more than three years in nine. [In twenty-five cases of acquired syphilis, the choroiditis appeared during the first year after infection in nineteen patients; between one and two years after contagion in four patients; and between two and four years in only two patients. Again, of twenty cases of choroiditis without corneal disease in inherited syphilis, I was able to ascertain the interval between birth and the onset of choroiditis in nine: it was within twelve months after birth in four; in early childhood, though the exact age was unknown, in two patients; in two other patients between one and three years; in one case the affection appeared about five years after birth.]

In a few cases, however, ten or fifteen years would seem to elapse between infection and the development of choroiditis. Hutchinson[2] mentions the case of a woman in whom the affection apparently began ten years later in one eye than in the other; and Hirschberg[3] gives a case in which it occurred nine years after reputed syphilis.

The course of the disease is slow and often prolonged for many years; temporary variations with steady progress from bad to worse characterise the disease, especially when it affects large tracts; but, after having been stationary for years, it may make progress afresh. Nevertheless, there are cases in which abundant choroiditis has run a short course and become permanently quiescent. In such cases

[1] Galezowski : Arch. Gén. de Méd. 1871, pp. 120—184.
[2] Hutchinson : Med. Times and Gazette. 1877, Nov.
[3] Hirschberg : Beiträge f. Augenheilkunde. 1878, p. 65.

the disease has generally the form of discrete, abruptly defined spots.

Complications.—The vitreous often becomes hazy from inflammation in the early period. [It was found to be so in about half the recent cases in acquired syphilis.] But on the other hand, it often quite clears up at a later period. Retinitis is a more formidable and apparently a more frequent complication. [Retinitis or atrophy secondary to retinitis was present in twenty-eight of thirty-seven cases of acquired syphilitic choroiditis, and it is equally common in inherited cases.] The optic disc participates in proportion to the retinal affection, and though the neuritic appearances are seldom very striking, they lead slowly, in severe cases, to atrophy. Cataract and detachment of the retina are among the rarest consequences of severe choroiditis, or more strictly speaking, perhaps, of cyclitis (the anterior choroiditis of authors). De Wecker has observed disturbance of the intellect in cases of choroiditis of very long standing. Probably this complication was due to simultaneous brain disease of syphilitic origin. Connected with this, it may be mentioned that Hughlings Jackson[1] has reported the case of a boy æt. fifteen with inherited syphilis, who had left choroiditis and greyish atrophy of the left disc, the right being normal; he had also dementia. The boy died, but there was no autopsy. Both his parents were syphilitic, and the father died insane at Colney Hatch. [I have notes of one case in a child, æt. eight, who was half demented, and I was shown by Dr. Barlow three similar cases; in all of them the choroido-retinitis was very severe.]

Syphilitic choroiditis affects both eyes in a large proportion of cases. [In forty-seven cases of acquired or inherited disease both eyes were affected in thirty-six; in eleven, one eye only was affected.]

Before describing the clinical aspects of choroiditis, it will be convenient to describe briefly the anatomical changes which take place in the affected structures. The disease is essentially a plastic inflammation of the innermost (capillary) layer of the choroid: in this part collections of small round cells are formed. These are either in separate little patches which slightly raise the inner surface and constitute the 'miliary gummata' of Hutchinson; or similar cells occur in wide-spread tracts of infiltration occupying the same layer of the choroid. The overlying pigment epithelium of the retina soon takes part in this growth of new cells. These cells change their size and increase their pigment. New cells often pass inwards from the choroidal exudation, and by mingling with the pigment cells,

[1] Hughlings Jackson: Jour. of Mental Science. 1875.

produce disturbance in the outer layers of the retina, and when still further organised, adhesions between the retina and choroid. There is also more or less thickening of the retina, especially of its outer layers, and changes occur in its blood-vessels. When the choroiditis is severe, the whole thickness of the choroid is affected, but even then the changes nearly always begin in the capillary layer. Atrophy of the choroid and retina is the final result unless resolution occur. The patch of inflamed choroid becomes thinned or completely wasted, and the proliferated and altered pigment epithelium accumulates upon or around this area in varying quantities. The outer layers of the retina also become more or less atrophied, and pigment often slowly passes inwards into the retina and accumulates there, chiefly in the sheaths of the blood-vessels (pigmentation of retina).[1]

The changes seen during life in the vitreous depend on a diffused cell-infiltration [2] which is set up by the choroiditis, and probably in some cases by the retinitis. The cells are often tailed or multipolar like those found in other cases of non-suppurative inflammation of the vitreous, and are not identical with the cells in the patches of inflamed choroid.

Symptoms.—The symptoms of choroiditis chiefly refer to the failure of sight which it causes when the retina and vitreous are involved. In the early period of a severe attack there may be general congestion of the vessels running upon the sclerotic, and of the arteries which perforate that membrane in the ciliary region, accompanied by more or less pain in the eyeball; but such symptoms are decidedly rare. Pain and difficulty in efforts of accommodation are also sometimes complained of. The failure of sight is described as a dimness or 'fogginess,' sometimes as a 'flickering' or 'quivering' of the object. The patients often complain that moving black or coloured spots interfere much with vision; fixed dark muscæ or gaps in the field of vision are also sometimes described. The failure of sight is usually somewhat gradual; but a history of repeated, rapid, and well-marked improvements of sight lasting for a few hours or even days, but followed by increased dimness, is often obtained on questioning the patient. In certain cases micropsia is complained of. An annular defect in the visual field between the fixation point and the periphery may often be found if looked for ('ring-scotoma'). A symptom of much importance, especially in severe cases of long standing, is night blindness combined usually with marked contraction of the visual field. In

[1] [Anatomically similar to the corresponding retinal changes in true Retinitis pigmentosa.]
[2] [I lately had the opportunity of examining such a specimen in the active stage of choroiditis.]

this respect the cases often closely resemble those of true retinitis pigmentosa. Although the sight in the course of two or three years may become extremely bad, syphilitic choroido-retinitis seems seldom to end in complete blindness.

Ophthalmoscopic changes.—Owing to the varying degrees in which the changes in the choroid, retina, and vitreous are combined in different cases, and in the several stages of the malady, it is best to describe the alterations in each part separately. In general, however, it may be stated that in the early period of the disease, the changes in the choroid are often less, and those in the vitreous and retina often much more easily seen by the ophthalmoscope than later on. In recent cases with haze of the vitreous, it is often very difficult to determine whether or not there is retinitis as well; and in cases of old standing the best criterion of the state of the retina is the size of its main blood-vessels and the presence or absence of pigment in its substance.

On the red background of the eye we may find:—(1) A number of scattered white, whitish-yellow, or pale red spots varying much in size, but commonly several times smaller than the optic disc: they may or may not be surrounded by a collar of black pigment. These spots represent in some cases exudations into the choroid, in others spots of atrophy of the membrane following absorption of such exudations. (2) Coal-black spots or blots upon larger patches of white—patches of atrophy with pigment accumulation. (3) Black spots or minute dots without any white patches, but scattered upon a background of paler red than that of the surrounding healthy choroid. When minute, these dots give a coarsely granular or pepper-and-salt appearance to the choroid. This appearance indicates atrophy of the innermost (capillary) layer of the choroid with alteration in the distribution and quantity of the pigment epithelium: the large vessels of the deeper layers are often seen with unnatural distinctness. (4) Large tracts with sinuous map-like outlines composed of patches of one or more of the above varieties which have become confluent, and therefore presenting endless varieties of ground-tint from red to yellowish-white, interspersed with more or less pigment in rings, blots, granular stippling or dappled patterns. Such areas are usually atrophic, but a peculiar dappled appearance is sometimes indicative of exudations into the choroid. This point indeed is sometimes very difficult to decide. *Less common changes* are:—(5) Bluish-white, or milky, soft-edged cloudy-looking patches combined with some of the appearances just described. These are recent exudations between the retina and choroid; the overlying retina is generally hazy, and it is often difficult to locate the change with precision. If the exudation be very

abundant, it may become organised into fibrous tissue, and cement the altered retina and choroid together. Such fibrous tissue appears as (6) white or grey tendinous-looking lines, or spurred patches, lying upon the choroid and mingled with pigment. Such scar-tissue indicates a severe attack. The patches of choroidal disease are of course seen with much more difficulty when the vitreous or retina is hazy, and are most pronounced in the atrophic stages.

Recent syphilitic disease of *the vitreous* is shown by a diffused haze which obscures the fundus either wholly or only in the central parts according to the situation and extent of the opacities. When carefully examined, such diffused haze may often be resolved into innumerable fine dust-like dots among which larger flocculi may sometimes be found; but cases occur where no separate opacities can be made out. In the course of weeks or months the fine dust-like haze gives place to larger specks or strings or to muslin-like webs (*toile d'araignée*), which float freely about as the eye is moved. In the end the vitreous often clears up altogether. But in old cases a single filamentous opacity is occasionally found stretching forward from a point near the disc, and apparently occupying Stilling's canal; isolated greyish globular or flask-shaped opacities of some size are also met with. In severe choroiditis of many years' standing, posterior polar cataract frequently forms. Disease of the vitreous is rarely seen in the choroiditis of inherited syphilis, probably because when the cases come under care in the early stage of the disease, the patients are usually too young to allow of an exhaustive examination.

Retinitis, whether primary (see below) or a result of choroiditis, is generally of the diffuse form. It is indicated by a nearly uniform mistiness of the membrane, seldom, however, so dense as to cause more than dulness of the normal red of the choroid. The central region is generally most affected. In recent cases the retinal veins are rather enlarged and the optic disc is more or less hazy and congested; but marked swelling and opacity of the disc are unusual and hæmorrhages are rare. [The diffused haze may often be resolved, by 'direct' examination, into a somewhat stippled or granular appearance, and sometimes lines or streaks of denser haze are noticed, not unlike 'cirrus' clouds. The haze is generally situated behind the retinal vessels, *i.e.*, in the layers nearest the choroid; this fact enables us sometimes to distinguish retinitis from haze of the vitreous, and throws light also on the mode of origin of the former affection.] In favourable cases the retina is restored to perfectly healthy appearance. But in bad cases, the haze remains though lessened in degree; the retinal arteries slowly shrink,

the disc takes on a yellowish pallor, and the retina often becomes pigmented.

In rare cases of either primary or secondary retinitis well-defined patches of opaque white exudation appear sometimes along the course of the vessels, or in connexion with patches of choroiditis.

Diagnosis.—Nearly all cases of symmetrical disseminated choroiditis in which the patches or areas are scattered about in various parts of the fundus, or in which they occur only at the periphery, are syphilitic. The presence, in recent cases, of haze of the vitreous and retinitis, and in old cases, of retinal pigmentation strengthen the evidence of syphilis. Even if only one eye be thus affected, the probability of syphilis is very strong. Moreover, in many cases, other results of syphilis will be present either in the eyes (old iritis, keratitis), or in other parts of the body, or the patient's history will be conclusive. But choroiditis, indistinguishable from that caused by syphilis, is occasionally met with in one or both eyes when there is no reason for suspecting that disease. This form of choroiditis is due to hæmorrhage, or in women, according to some writers, to anæmia. Choroidal disease, limited to the central parts of the fundus, whatever its form, is less likely to be syphilitic, since changes near the yellow-spot and disc are often connected with myopia, or with large retinal or choroidal extravasations in this region. Pigment dots are sometimes seen after a severe attack of albuminuric neuro-retinitis; the optic disc in such cases is very pale (atrophied) and often irregular, and there are no well-marked choroidal patches. True pigmentary degeneration of the retina, *retinitis pigmentosa*, is distinguished from syphilitic choroido-retinitis by its greater regularity and more accurate symmetry, and by the absence of the coarse choroidal changes which have been described.

The prognosis depends upon the extent and duration of the affections. If scanty, the eye may not suffer perceptibly in visual power. In some of the worst cases the choroiditis is quite superficial, but very widely spread and accompanied by much retinitis. The protracted and insidious nature of the disease, and the frequency of relapses even after improvement of the sight has been gained by long treatment, prevent any certainty of cure or of permanent retention of sight. Still in many cases, especially of the discrete form with abruptly defined patches, no tendency to progress or to make a fresh start after a long pause is seen. Hutchinson[1] has recorded a case where a patient after being almost totally blind for four years, regained such power of sight as to be able to read the newspaper.

Primary Syphilitic Retinitis, that is, disease of the retina beginning

[1] Hutchinson : Med. Times and Gazette. 1877, Nov. 17.

in that structure, is a much less common affection than retinitis caused by, or associated with, choroiditis. [I have notes of only some half dozen such cases. In half of these, iritis occurred either before or with the retinitis.] In many cases of recent choroido-retinitis with much retinal haze, the choroidal changes may, as already observed, be readily overlooked for a time, and the case be described as mere retinitis.

The ophthalmoscopic changes and the symptoms in pure or primary retinitis are so like those in the form associated with choroiditis, that a second description is not necessary. There is the same absence of photophobia, the same dimness, flickering, micropsia, ring-scotoma and night-blindness; and in the course of the case the same tendency to repeated, rapid, spontaneous improvement followed in a few hours or days by relapse. As in the secondary form, haze is often most noticeable beneath the retinal vessels, and this suggests the suspicion that some even of these cases may in truth be primarily choroidal. There is in this primary form more decided optic neuritis with opaque lymph on the disc, than in the secondary variety; the neuritis may constitute the principal change, but is never very gross. The vitreous is usually hazy, or may contain a few large deeply-seated opacities. Sometimes with double retinitis, the vitreous is affected in only one eye. The retinal disease implicates chiefly the central region. It is almost invariably symmetrical, and comes on between three and fifteen months after the patient's infection.

A particular variety described by von Graefe as central recurrent retinitis,[1] and as occurring at a much later period of syphilis, would seem to be rare, as no cases corresponding to von Graefe's description have been recorded lately.

[1] See three cases by Alexander: (Berlin. Klin. Wochenschrift, 1876, pp. 508 and 523). Two of them occurred in secondary syphilis. They did not differ from ordinary syphilitic retinitis.

SYPHILIS.

CHAPTER X.

THE EAR.

Our knowledge of the several ways in which syphilis may attack the organ of hearing is still very imperfect. Nevertheless, aurists have succeeded in defining certain maladies of the ear as indisputably syphilitic.[1] They may occur both in *acquired* and in *inherited* forms of the disease.

Syphilitic affections of the ear may be arranged according to seat. 1. Of the External Ear. 2. Of the Middle Ear and Eustachian tube. 3. Of the Internal Ear.

The External Ear.—Hulot[2] has described as an instance of the *initial lesion* of syphilis an ulcer at the base of the left tragus, accompanied by enlargement of the lymphatic glands below the left mastoid process, and along the course of the left trapezius muscle; but as the patient was not seen by the reporter until a syphilitic eruption had been present for three months, the evidence of the initial character of the sore is imperfect.

Papules on the external ear during the course of the general eruption are not rare. They are usually developed round the outlet of the external meatus and in the concha, and form prominent greyish fungating sores, often divided from each other by painful fissures of the skin. They secrete a thin acrid pus, and multiply readily inwards along the meatus so as sometimes to close the passage and produce partial deafness. These ulcerating papules do not extend to the deeper portion of the meatus nor to the outer surface of the membrana tympani. Moist papules are also sometimes developed behind the ear, where the skin is reflected from the head to the

[1] See an essay by Schwartze: Beiträge zur Pathologie und Pathol. Anatomie des Ohres. Archiv f. Ohrenheilkunde. 1869, 4 Band, p. 235, *et seq.*

[2] Hulot: Annales de Derm. et de Syphiligraphie. 1879, tom. x., p. 47. The case was observed in Fournier's Clinic.

pinna. Dry papules are less common than moist ones, but they are occasionally seen on the concha, especially along the helix and anti-helix.

The Middle Ear.—Acute affections of the middle ear may occur independently of the condition of the throat, but more commonly by extension of the congestion and ulceration of the mucous membrane in that region. In the latter form it is usually one-sided, and there are mucous patches or ulcers on that side of the throat. This affection most commonly developes during the second six months after infection, but may occur at any time during the first three or four years. The ulcer of the throat, from which the aural mischief has extended, if small, may escape notice unless very careful search be made by lifting the velum. The course of the affection is generally insidious, and has made some progress before the patient experiences much inconvenience. Sometimes tearing pains are complained of; and in one of Schwartze's cases, attacks of giddiness and staggering were the earliest symptoms. These symptoms, it must be observed, are usually attributed to implication of the internal ear. The hearing distance is shortened to one foot, or less, and a watch is heard better when laid on the mastoid process than on the external ear, but the tuning-fork is always heard on the vertex. On inspecting the external meatus the deeper part of the canal may be reddened; the membrana tympani is always drawn inwards, while the increased redness of the mucous membrane lining the drum may often be seen through the membrane. As a rule, according to Dalby,[1] this catarrh subsides with perfect recovery; but it may run on to suppuration and perforation of the membrana tympani, producing the otorrhœa that is mentioned by some authors as a precursor of deafness. In nine of Hutchinson and Jackson's 100 cases[2] of inherited syphilis, otorrhœa had been present during the course of the disease. Schwartze found otorrhœa to be a rare complication in deafness from syphilis.

Chronic disease of the Middle Ear is, according to Schwartze, an insidious affection, attacking first one organ then the other, and causing rapid impairment of hearing. The period at which the deafness begins is usually about three months after the outbreak of the general exanthem. In Schwartze's cases the watch could only be heard by pressing it on the ear, while conduction of sound through the bones of the head soon became very imperfect. The membrana tympani was always greyish white, dull, and devoid of lustre. Occasionally the vessels over the handle of the malleus were injected, as were those of the cuticular layer of the membrane.

[1] Dalby: Lancet. 1877, Feb. 10, p. 191.
[2] Hutchinson and Hughlings Jackson: Medical Times and Gazette. 1861, Nov. 23.

The mucous membrane of the pharynx was congested, and occasionally shallow ulcers of the tonsil and velum were present. The Eustachian tube was always permeable, and inflation of the drum did not improve the hearing. The termination was either great or total deafness, the effect of treatment in Schwartze's experience being most unsatisfactory. Deafness may be also due to occlusion of the orifice of the Eustachian tube, by cicatricial contraction after ulceration of the pharynx, or by adhesion of the soft palate to the posterior and lateral walls of the pharynx. Sexton [1] records five cases of this mechanical form of deafness.

Sometimes pain is felt in the ear, but more often in the temple and forehead, much worse by night than by day, while tinnitus is nearly always present, though of varying intensity. Schwartze holds the characteristic symptoms of this affection to be its bilateral character, the nocturnal temporal and frontal pain, the very rapidly increasing deafness and early impairment of the conductive power of the cranial bones. Sturgis [2] has related two cases that differ in some degree from Schwartze's description. The power of hearing was not so greatly diminished, and he found the pain (in one case radiating along the jaws), to be seldom severe, but dull with sharp twinges and greatly increased at night. In both the cases the deafness was greatly improved by treatment, an exceptional occurrence with Schwartze.

The Internal Ear.—The distinctions between chronic affections of the middle ear and those of the internal ear are at present so imperfectly made out that it is by no means certain that much of what is considered due to disease of the latter may not be caused by affections of the former. Sexton [3] indeed contends that the cases of so-called labyrinthine deafness are really due to disease of the middle ear.

The usual time for the appearance of symptoms pointing to lesions of the internal ear in acquired syphilis is soon after the disappearance of the general eruption. In inherited syphilis, Hutchinson [4] met with this form of deafness about the time keratitis appears, that is from five years before to five years after puberty. Purves [5] found that in inherited syphilis the affections of the middle ear and Eustachian tube were contemporary with those of the cornea, while affections of the acoustic nerve were later in point of time, and were never present in any considerable degree without the retina, choroid, or optic nerve being also affected. Hence this observer attaches

[1] Sexton : Amer. Journ. Med. Sci. July, 1879, p. 57.
[2] Sturgis : Boston Med. and Surg. Journal. 1880, June 3.
[3] Sexton : Loc. cit.
[4] Hutchinson : On Certain Diseases of the Eye and Ear, &c. 1863, p. 177.
[5] Purves : Guy's Hospital Reports. 1875, p. 564.

great importance to the examination of the eye in the deafness of young persons. Pritchard's[1] cases also support this view.

In most cases when the internal ear is affected, the deafness comes on rapidly and proceeds to almost total loss of hearing, but without pain. According to Roosa[2] there is especially loss of perceptive power of high-pitched sounds. Both ears are attacked equally. The termination is commonly complete and permanent deafness, though Roosa met with a case where hearing was gradually regained under anti-syphilitic treatment. Hutchinson[3] has seen rare cases of recovery without special regard to treatment.

The labyrinthine form of deafness is specially distinguished by loss of conductive power through the cranial bones. This is demonstrated by the inability of the patient to perceive vibrations of a tuning-fork when applied to the vertex of the skull. Giddiness and staggering are also claimed as symptoms indicative of disease of the cochlea by Roosa, but not generally by writers on aural disease.

Hinton[4] finds one in twenty of his aural patients affected with this form of deafness caused by syphilis: indeed he knows of no chronic disease besides syphilis which can render a patient under twenty, previously hearing well, so deaf in a few weeks that he cannot distinguish words. The majority of his patients were females. This form of sudden deafness is by most observers believed to be of nervous origin, but only one post-mortem examination has been recorded: that of Moos.[5] In this patient, seven years after infection, giddiness came on with considerable sensitiveness to noise, and pain in the bones of the skull, together with periosteal nodes on both temporal bones. There ensued sudden and remarkably rapid loss of hearing. After death, Moos found induration of the pars petrosa, periostitis of the cochlea and tympanum, with small-celled infiltration of the upper labyrinth. There was also anchylosis of the stapes to the vestibule. The external and middle portions of the ear were unaltered.

[1] Pritchard: Brit. Med. Journal. April 21, 1877.
[2] Roosa: New York Medical Record. November, 1876; and Archives of Dermatology. April, 1875.
[3] Hutchinson: Med. Times and Gazette. 1875, vol. i., p. 61.
[4] Hinton's edition of Toynbee on Diseases of the Ear. See also Holmes's System of Surgery. 1870, vol. iii., p. 322.
[5] Moos: Virchow's Archiv. 1876, Bd. 69.

SYPHILIS.

CHAPTER XI.

THE GENITO-URINARY SYSTEM.

I.—The Urinary Organs.

The Urethra and Bladder.—The urethral orifice in both sexes is not infrequently the seat of the initial lesion of syphilis, which however, is very rarely situated far beyond the meatus. (See Chap. III.)

A scanty urethral discharge is described by some authors to appear occasionally during the course of the initial sore, or even of the early secondary eruptions. The discharge lasts only a short time and subsides spontaneously; but it may return, according to Tarnowsky,[1] with subsequent outbreaks of syphilitic symptoms elsewhere. This observer also states that the discharge depends on the presence of small greyish ulcerated spots scattered over the mucous membrane of the anterior part of the urethra. Taylor,[2] on the other hand, who has also made endoscopic examinations, found only a temporary congestion of the mucous membrane in such cases. Henry Lee[3] is of opinion that there are two varieties of syphilitic urethritis; one which appears a few days after exposure to contagion and is followed by initial lesion and other signs of syphilis; and another variety which occurs in patients already syphilitic and which may come on without any fresh infection.

In our own experience at the Lock Hospital and in private practice, cases of simple sero-purulent urethral discharge of moderate quantity and short duration are not infrequent in males during primary syphilis. In no case has there been any appreciable amount

[1] Tarnowsky: Venerische Krankheiten. 1872, p. 198.
[2] R. W. Taylor: Archives of Dermatology, vol. i., p. 263.
[3] Lee: St. George's Hosp. Reports, vol. vi. 1871-72.

of irritation or scalding experienced by the patient; and invariably has the discharge subsided in a few days or weeks after its first appearance, even when submitted to no local treatment. The form which we have observed always accompanies the development of the initial sore, certainly never appearing so soon as a few days after contagion. We have no knowledge of the later form mentioned by Henry Lee.

Certain authors, among them Ricord,[1] Virchow,[2] Voillemier,[3] and Tarnowsky,[4] have attributed to syphilis certain lesions of the *urethra and bladder* which were found post mortem in persons with more or less clear evidence of having suffered from syphilis during life. Proksch[5] has recently collected six such cases which he appears to accept as syphilitic; but in most of the instances recorded, the evidence of the syphilitic nature of the lesions is defective. In the cases reported by Virchow and Tarnowsky, however, there is clear evidence of syphilis.

In Virchow's case, the patient was a woman, who had long been syphilitic, and who died at the age of 84. Post mortem there was found ulceration of the urethra, bladder, and vagina, with old cicatricial contraction of the latter.

Tarnowsky's patient was a boy four years old, who had been infected with syphilis by his nurse. On admission into the hospital at St. Petersburg, the child was covered with a papulo-pustular eruption, and had also mucous patches and ulcers of the mouth and throat. A few days after admission, he complained of pain on passing water, and the urethra was hard and painful on pressure. The child wasted and gradually sank. At the autopsy, the mucous membrane of the urethra and part of the bladder was found to be beset with superficial ulcerations. The prostate, vesiculæ seminales, vasa deferentia, and testes were healthy. The liver was syphilitic, and the left lung was in a state of hepatisation.

A form of chronic ulceration of the urethra in women has been described by West[6] as probably dependent on syphilis, but with the exception of the fact that the six cases which West has seen occurred in women who were either prostitutes or who had suffered from venereal disease, there seems to be no evidence of its connection with syphilis; and it is important to note that anti-syphilitic remedies have no power over it. Oedmansson[7] of Stockholm has also observed six cases of a similar kind to those recorded by West, but does not attribute the affection to syphilis. In his cases also mercurial treatment was of no avail.

[1] Ricord: Clinique Iconographique. 1851.
[2] Virchow: Würzburger Verhandlungen. 1852, vol. iii., p. 366.
[3] Voillemier: Traité des Mal. des voies urinaires. 1868, i., p. 133.
[4] Tarnowsky: Loc. cit., p. 199, and Plate VI.
[5] Proksch: Vierteljahresschrift f. Derm. u. Syph. 1879, iv. heft.
[6] West: Diseases of Women, 4th edition. 1879, p. 615.
[7] Oedmansson: Nordiskt Med. Archiv. 1877, Band ix., No. 14; and Gaz. Hebdom. 1877, Dec. 7.

In the *ureters or pelves of the Kidneys* syphilitic affections have not yet been observed.

The Kidneys.—The kidneys are much less frequently than the other viscera the seat of syphilitic lesions.

Albuminuria is not of very infrequent occurrence during the exanthematous stage of syphilis. It is usually only temporary, and its special causation is unknown. Lancereaux[1] mentions three cases of albuminuria occurring during the first six months of syphilis. Two of the patients had been under prolonged mercurial treatment, and Lancereaux thinks that may have had something to do with the albuminuria. Perroud[2] also has reported two cases in which albumen appeared in the urine, in one case four, and in the other six months after the initial lesion. Hardy[3] considers the occurrence of albuminuria in secondary syphilis to be not directly due to the syphilitic poison, but merely dependent on it, inasmuch as syphilis impairs the strength, and thus renders the patient more susceptible to any pathological influence.

Acute Bright's disease.—Bradley[4] records the case of a child, aged four months, who was covered with a syphilitic eruption, and whose urine was highly albuminous, and contained epithelial and granular casts. The face and limbs were œdematous. There had been no exposure to the poison of scarlatina. After three weeks' treatment by mercury the skin eruption, the albuminuria, and the œdema had all disappeared. E. Wagner[5] has recorded a well-marked case in acquired syphilis where the urine was carefully examined. The symptoms were completely those of acute Bright's disease: no mercury had been given in his case.

The anatomical changes met with in the kidneys of syphilitic persons are of two kinds, (*a*) those due to chronic congestion or irritation; such as granular kidney and lardaceous disease: (*b*) those special to syphilis; isolated gumma, and interstitial hyperplasia. The arteries and veins also may undergo syphilitic thickening of their coats. In twenty post mortems of visceral syphilis Lancereaux[6] found interstitial nephritis four times, gumma once, and cicatrices of the surface with atrophy several times.

The non-specific forms have been recorded so frequently in making the post mortem examinations of syphilitic persons, that

[1] Lancereaux: Loc. cit., p. 153.
[2] Perroud: Journ. de Méd. de Lyon. Feb., 1867.
[3] Hardy: Union Médicale. April 1, 1879.
[4] M. Bradley: Brit. Med. Jour. Feb. 4, 1871.
[5] E. Wagner: Die Const. Syph. ü. die davon abhängigen Nierenkrankheiten, Deutsch. Arch. f. Klin. Med., 1880. Bd. 82, p. 96.
[6] Lancereaux: Bulletin de l'Académie de Médecine. Janvier, 1864; and Traité de la Syphilis, 2nd edition, p. 235.

there can be no doubt that syphilis is a determining cause of these changes in many patients. But such affections when excited by syphilis have nothing peculiar in them, though the syphilitic lardaceous kidney differs somewhat from the ordinary form.

Lardaceous Disease.—This change is the one most frequently found in the kidneys of syphilitic persons. Of eighty-three fatal cases of lardaceous disease observed in St. George's Hospital, and referred to by Dickinson[1] in the Croonian Lectures for 1876, there was evidence of syphilis, historical or pathological, in eighteen. In eleven of these eighteen cases, as no excessive suppuration had been present, the disease was attributed to syphilis. Virchow[2] believes that it is caused by the cachexia of syphilis. Klob[3] found lardaceous disease present when the lesions characteristic of syphilis were well marked. Indeed, it is now generally admitted that lardaceous disease may occur in constitutional syphilis without any obvious suppurative disease.

With regard to the appearance of these kidneys, Moxon[4] remarks that "if we are guided by an expectation that a lardaceous kidney should be 'bacony,' we shall overlook four out of five—at least in syphilitic examples. The usual form of the syphilitic lardaceous kidney is that of the large white kidney of Bright. On microscopical examination the tubes are found distended and lined with a squamose epithelium, the small vessels giving an amyloid reaction." The essential change consists in an infiltration of a nitrogenous material, beginning with the small arteries and afterwards involving other tissues. The Malpighian tufts appear large, white, and opaque, and become still more evident if solution of iodine be poured over the kidney, when they assume a hue much browner than the other parts of the section. E. Wagner[5] also describes kidneys where the glomeruli were undoubtedly lardaceous.

Gummata of the kidney are generally situated in the cortex near its surface; and in all the instances hitherto recorded, similar nodules were also present in the liver. These growths may be found in an early state, but more usually as caseous patches or mere fibroid scars. Cases of gumma of the kidney have been reported by Virchow,[6] Beer,[7] Klebs,[8] Lancereaux,[9] Moxon,[10] M. Mackenzie,[11]

[1] Dickinson: Lancet. 1876, vol. i., p. 627.
[2] Virchow: Krankhafte Geschwülste, B. ii., S. 430 and S. 471.
[3] Pleischl und Klob: Wiener Med. Wochenschrift. 1860, S. 113.
[4] Moxon: Guy's Hosp. Reports. 1868.
[5] E. Wagner: Loc. cit.
[6] Virchow: Krankhafte Geschwülste, ii., p. 431.
[7] Beer: Eingeweide Syphilis. Tübingen, 1867, SS. 33, 63, 93, 132.
[8] Klebs: Path. Anat., p. 647.
[9] Lancereaux: Loc. cit., p. 235.
[10] Moxon: Guy's Hospital Reports. 1868.
[11] M. Mackenzie: Path. Trans. 1871, p. 34.

Paolucci,[1] Greenfield,[2] Cornil,[3] Wagner and others. In Moxon's case the gumma "was the size of a small potato," and was seated at the lower end of the left kidney. In Paolucci's case both kidneys were the seat of numerous small cheesy nodules, similar nodules being present in the liver and spleen. In Greenfield's case the kidneys were enlarged, and throughout the cortical substance were very numerous patches of pale yellow colour, with a sharp outline and surrounded by a zone of congestion. Cornil found twenty gummata in the cortex of the kidney of a woman whose liver also contained numerous similar growths. In another case examined by the same observer in conjunction with Coyne, a single gumma was present in the kidney.

When the kidney is attacked by *interstitial hyperplasia* the change generally begins in one or two, sometimes in several points at once. The stroma thickens, and contracts to some extent. The glandular structure also suffers by compression from the thickening and contraction of the interstitial tissue; the cells of the tubules waste, the Malpighian bodies shrink, and their envelopes thicken. This process of cirrhosis is usually limited in extent, and only exceptionally pervades the kidney generally. Such a kidney has its surface unevenly marked by deep seams. The capsule is tough and adherent. White bands of cicatricial tissue traverse the organ, and gummy nodules are sometimes connected with the bands. The cirrhosis produced by syphilis is not different in appearance from cirrhosis produced by other causes, and a kidney is only pathognomonically syphilitic when it contains gummata, either with or without cirrhosis.

Greenfield[4] and E. Wagner[5] have reported cases in which disease of the *arteries of the kidney* was found. The walls of the vessels were infiltrated with gummatous growth, the lumen was nearly obliterated by endarteritis, and small tracts of the kidney supplied by these vessels resembled infarcts.

The symptoms of renal disease in syphilis do not differ from those of chronic affections of the kidney from other causes. The affection runs a similar course, and often reaches a similar termination if its true nature be not recognised. This often can only be guessed at from the history of the case, from the presence of syphilitic symptoms elsewhere, and in some cases, happily, from the influence of treatment.

[1] Paolucci: Il Morgagni. 1874, Disp. vi.
[2] Greenfield: Path. Trans. 1876, p. 313. See also Atlas of Pathology, New Sydenham Soc. Fascie 2, 1879.
[3] Cornil: Leçons sur la Syphilis. 1879, p. 442.
[4] Greenfield: Path. Trans., vol. xxvii., p. 313.
[5] E. Wagner: Loc. cit. pp. 105 and 107.

In inherited syphilis, as well as in the acquired form, the kidney is occasionally involved. Klebs[1] has recorded a case; Pollnow[2] also has met with gummy nephritis in a fœtus. Coupland[3] found the kidneys unduly firm and pale in a child three months old, who had also extensive syphilitic changes in other organs. Lancereaux[4] found interstitial thickening of the kidney and a granular and fatty change in the epithelium of the tubules in an infant whose parents were syphilitic. The liver in this case presented the peculiar change first described by Gubler.

II.—The Generative Organs.

The Penis, besides being the frequent seat of papules and mucous patches in the earlier stages, is also in the tertiary period not very rarely attacked by gummy nodules. When these nodules break down, a ragged irregular ulcerating sore is left which is liable to be mistaken for the initial lesion of syphilis, or the local contagious chancre. The points of difference between the two affections will be noticed in the Chapter on 'Chancre.' When gummata develope in the cellular tissue of the sheath of the penis, or between the layers of the prepuce, they may be easily mistaken for cystic or other simple growths, and indeed have been excised before their true nature has been recognised.

The following case is an unusual example of gummy infiltration of the prepuce:—

T. M., æt. 41, infected with syphilis 21 years before, and having well-marked cicatrices of the pharynx and deformity of the epiglottis and other parts of the larynx, came under our care at the Lock Hospital on June 13, 1876. Two months previously, a little shallow sore had shown itself on the foreskin near the free border. In six weeks the sore turned black and became covered with a thick scab. One week later the left groin suddenly swelled, and shortly after that the penis and the right groin also swelled. On admission, the whole penis was œdematous, the œdema spreading outwards on each side to the groins, where the lymphatic glands were enlarged and prominent. A sore one inch broad and half an inch long, occupied the outer surface of the right side of the prepuce. The base was hard, and the sore was covered by a black depressed crust, consisting of concentric, closely-packed layers. The surface of the scab was flat and almost smooth. Iodide of potassium was given, and lead lotion was applied locally. A week afterwards the scab had fallen, and the sore presented a concave granulating surface; the swelling had disappeared, and the enlarged glands were subsiding. Under prolonged treatment, the ulcer healed, and the normal condition of the parts was restored.

In the *corpora cavernosa* gummy nodules sometimes form, but are extremely rare. The gumma begins as a small deep-seated and gene-

[1] Klebs: Path. Anatomie.
[2] Pollnow: Inaug. Dissertation. Berlin, 1874.
[3] Coupland: Path. Trans., vol. xxvii., p. 303.
[4] Lancereaux: Loc. cit., p. 420.

rally ill-defined lump, and, according to Zeissl, is situated nearly always in the posterior third of the organ. It is painless, and causes no inconvenience while the penis is flaccid. During erection, a peculiar kind of chordee is produced, the affected corpus is not injected, or only partly injected with blood, and the penis curves over towards the groin of the affected side. Should the nodule be situate on the upper surface rather than to one side, the penis is turned backwards to the belly, so much so in some cases, according to Ricord, as to form a ring, and thus render intercourse impossible. These nodules have not been observed in the corpus spongiosum, which, on the contrary, in gonorrhœa, is the part most frequently attacked by acute inflammation and chordee. The gummy nodules may disappear spontaneously or may break down if not dissipated by anti-syphilitic treatment.

The Vesiculæ Seminales and Prostate have not yet been proved to be attacked by syphilis. With regard to the prostate, Lancereaux[1] remarks that some cases of enlargement of this organ may perhaps be due to syphilis; and mentions a case where an alteration in the gland was found, which he was inclined to attribute to that disease.

The Spermatic Cord nearly always remains free in cases of syphilitic disease of the epididymis or testis. Cases have, however, been observed in which a syphilitic enlargement of the cord has been diagnosed. Thus Verneuil[2] has recorded a case of gummy swelling of the cord in a patient who had also a gumma in the heart. The specimen in this case was presented by Lhonneur to the Société Anatomique of Paris in 1856. The morbid growth was found after death to be the size of two fists; it occupied the scrotum, and ascended along the cord as far as the iliac fossa. The growth had been mistaken for cancer during life. Lancereaux[3] gives details of a case in which, in connection with syphilitic disease of the testis and epididymis, the cord was enlarged and swollen in several places, one of the swellings being as large as a chestnut. Recovery took place under iodide of potassium. Fournier[4] again, mentions a case of syphilitic testis where the cord was involved.

In inherited syphilis also the cord may be affected. A child under the care of Obédénare,[5] with enlargement of the testis, had also enlargement of the spermatic cord. These cases will be again noticed in the section on the testis.

The Epididymis.—A form of epididymitis which occasionally

[1] Lancereaux: Loc. cit., p. 228.
[2] Verneuil: Dict. Encyclopédique des Sci. Méd., tom. ii., p. 286.
[3] Lancereaux: Loc. cit., p. 222.
[4] Fournier: Du Sarcocèle Syphilitique.
[5] Obédénare: Bull. et Mém. de la Soc. de Chirurgie de Paris. 1875, p. 140.

occurs in early syphilis has been described by Dron.[1] The affection is characterised by an indolent and painless enlargement of the globus major. The swelling may extend to the whole epididymis, but the head is always attacked first, and usually is alone affected. Only once in the sixteen cases observed by Dron was the globus minor involved. Fournier,[2] who has observed eight well-marked cases, has never seen the whole epididymis enlarged. The testis remains free. The swelling is hard, and is usually about the size of a pea or an olive, but may be large as a walnut. Both organs were affected at the same time in six of Dron's cases. The most usual time for the appearance of this affection seems to be about three and a half months after the appearance of the initial lesion. Of five cases in which Dron was able to ascertain the period of commencement, he found the earliest two months and the latest five months after the primary sore. In six of Fournier's cases the enlargement appeared during the first seven months after the initial lesion; and in the other two at the tenth and eleventh month respectively. The swelling subsides after a few weeks. In all Dron's cases resolution occurred under specific treatment. In one instance the tumour was adherent to the scrotum for a time.

The following case came under my care at University College Hospital. A man, ætat. 22, applied for relief for a swelled testicle, which was also a little painful. The right epididymis was enlarged, chiefly at the upper part; the testis itself was not altered, and the whole organ had very little tenderness. The patient had noticed this enlargement of the epididymis about one week, and there had been no discharge from the urethra. I found on examination an indurated sore under the foreskin, enlarged glands in the groin, and a roseolar rash over the whole body, including even the face and extremities. The patient was directed to wear a suspensory, and to take mercury. The enlargement of the epididymis almost completely subsided in ten days, but no discharge from the urethra then showed itself. I have since seen another similar case.—B. H.

Diagnosis.—The indolence and seat of the enlargement, viz. the head instead of the tail of the epididymis, will be sufficient to distinguish the affection from gonorrhœal epididymitis; while the rapid subsidence of the swelling under anti-syphilitic treatment will exclude tubercle.

In later syphilis the epididymis is very rarely attacked unless by extension from the body of the testis when the disease there is far advanced. In two cases recorded by Sir Astley Cooper[3] the epididymis was enlarged as well as the testis. But we have seen nodules there without any gummata being evident in the testis. Bertholle[4]

[1] Dron: Archives Gén. de Médecine. 1863, pp. 513 and 724.
[2] Fournier: Annales de Dermatologie et de Syphiligraphie, tom. vi., p. 224.
[3] Astley Cooper: Observations on the Structure and Diseases of the Testis. 4to, 1830. p. 105. See also Tanturri: Epididymite secondaria e gommosa. Il Morgagni, Disp. 2, 1872.
[4] Bertholle: Union Médicale. 1868, vol. i., p. 57.

has recorded a case in which a man who had been twenty years syphilitic had two fistulæ of a year's standing connected with the epididymis. Under specific treatment the fistulæ closed in seven weeks; some nodes which were present at the time also disappeared. Six years afterwards the man remained perfectly well. Greenfield[1] mentions having found a small gumma in the epididymis after death, but gives no particulars of the case. This is the only post-mortem example of gumma in this region we have been able to find.

The Testis.—The affections of this organ are known by the names of *Syphilitic sarcocele, Syphilitic orchitis, Syphilitic albuginitis.*

Early writers on syphilis appear to have been indistinctly aware of the occurrence of specific disease in the testis, but Sir Astley Cooper was the first in this country to give a clear description of the nature and course of the malady.

The disorder is commonly delayed till two or three years after infection, and often later still. It may begin much earlier than this time: Hutchinson,[2] indeed, mentions a case where gummata were found in both testes by Sutton in the body of a man who had also gummata in the heart and in the spleen, the secondary eruption being still present on the skin. This observer[3] insists also on the comparatively early stage of syphilis at which the testicle is usually affected, namely, between the period of general eruptions and that of tertiary sequelæ. Ricord says he has seen the testis diseased as early as the fourth or fifth month. One case has come under our notice where the testis enlarged at the end of the sixth month, but the alteration in this instance resembled subacute orchitis more than the peculiar enlargement of syphilitic sarcocele. This patient had also nodes and rupial eruption at the time the testis enlarged. All the symptoms were rapidly relieved by the iodides of mercury and potassium.

Sarcocele is a rare complication of syphilis compared with other affections. Less than one per cent. of those treated by Zeissl for constitutional syphilis in the Vienna Hospital were so afflicted. Jullien[4] collected 234 cases of tertiary syphilis, in twenty-five of which the testicle was affected. At the time of the outbreak in the testis, symptoms of a syphilitic character are often present in other parts of the body, such as periosteal affections, hepatic disease, pustular eruptions, tubercles, or ulcers of the skin and mucous membranes. On the other hand, the poison, after several years of apparently complete quiescence, will sometimes show its returning activity in the testicle alone. Marc Sée[5] reports a case where

[1] Greenfield: Path. Trans. 1877, p. 255.
[2] Hutchinson: Path. Trans. 1876, p. 347.
[3] Hutchinson: Idem. 1877, p. 312.
[4] Jullien: Maladies Vénériennes. 1879, p. 926.
[5] Marc Sée: Gaz. Hebdom. 1879, Avril 25.

syphilitic disease of both testes occurred thirty years after the primary disease.

Causes.—The immediate cause of the morbid action in most instances is probably a blow or slight injury of some kind, or excessive sexual indulgence. Gonorrhœa and epididymitis have apparently no influence in rousing the development of sarcocele of this kind.

Course and Symptoms.—The enlargement of the testis usually makes considerable progress before it attracts attention, but when by chance the disease is detected early, the testicle may be somewhat firmer than the unaffected organ. The scrotum, cord and epididymis at this stage, are perfectly natural. If the surface of the testis be carefully examined, it will be found to be slightly uneven, or even nodulated, and less compressible at one or two points than elsewhere. This change is owing to the induration of isolated parts in the substance of the testis. The masses gradually increase in size and number; when far advanced, they often coalesce. Sometimes the development proceeds so rapidly, that in the course of a few weeks the testicle may gain twice its previous size. The nodular form of the organ is lost by this general enlargement. The surface of the testis is then smooth, and encroaches on, and in very advanced cases almost entirely conceals, the epididymis; otherwise that body can be felt behind the testis in an unaltered condition. In some patients the nodules are more distinct than those just described, and appear to be projections growing on the surface of the tunica albuginea. They vary in size from a pea to a hazel-nut or larger, and form that variety which is most apt to attach itself to the integuments and produce adhesion, ulceration, and fungus testis. Some authors, Duplay and Gosselin[1] for example, maintain that these superficial nodules are gummata springing from the surface of the fibrous tunic and only slightly if at all connected with the internal parts of the testis.

Pain is generally altogether absent until the testicle has acquired sufficient weight to excite aching along the cord and in the loins. Sir Astley Cooper[2] states that pain, increased by night, now and then attracts the patient's attention to his testis. The peculiar sensation caused by compressing the healthy organ soon becomes diminished in the syphilitic testis, and often lost altogether; only in the earliest stages of the affection is it greater than in health. The enlarged organ also feels less elastic, or firmer than the healthy one. By the time the testis has gained some enlargement, a small quantity of thin clear fluid often collects in the tunica vaginalis, probably from congestion of the vessels during the progress of the inflammatory changes in the tunica albuginea. This fluid is usually of small

[1] See Reynier: Sarcocèle Gommeux, Archives Gén. de Méd. 1879, Avril, p. 396.
[2] Astley Cooper: Loc. cit., p. 103.

amount, and is of no moment. The size of the organ increases slowly, and, according to Ricord, never exceeds twice that of the healthy testis. When the disease has existed for some time in one testicle, the other nearly always enlarges in a similar manner; for this affection attacks both testes more frequently than any other malady of these organs. Goodhart[1] found both testicles affected thirty-eight times in sixty-two necropsies. Zeissl has observed the testes enlarge simultaneously. We also have notes of a case where the disease in the left preceded that in the right testis by a very few weeks, and both increased in size at the same time. The virile power of the patient in double orchitis is greatly lessened, or even destroyed, and the sexual appetite is usually lost during the time this condition continues. The scrotum often remains unaltered throughout the disease. In this respect syphilitic tumours are distinguished from tubercular or malignant growths, which cause adhesion and ulceration of the scrotum. Exceptions to this immunity are not common, but Rollet,[2] De Meric,[3] Curling,[4] and others relate cases where the deposit of syphilitic matter in the testicle was accompanied by circumscribed inflammation of the scrotum, abscess, and fungous granulations of the opening left by the abscess. Curling has thrice seen fungus of both testes at the same time. In Sée's case also there was double fungus.

In our own experience the ulceration of the scrotum may assume two forms. In one, there is no fungous protrusion; in the other, the granulations spring from the interior of the testis, break through the tunica albuginea and integuments, and form the exuberant mass termed benign fungus testis. In the first, the gummy growth probably begins on the outer surface of the tunica albuginea or even in the more superficial investments, and contracts adhesions with the soft tissues overlying it; then, growing onwards into their substance, it ultimately undergoes softening and disintegration. Thus an ulcer is produced in the scrotum, which has the following characters: the floor is yellowish-grey and tolerably even, the scrotum around it, adherent widely to the testis, is thickened, purple red, and at the edges of the sore, ragged, undermined and melting away. Such sores in time granulate and cicatrise with adhesions. Throughout they have no tendency to form fungous protrusion. Usually only one such ulcer forms, but two or three may occur together. They have no special seat, but are common at the lower part of the scrotum. They soon heal soundly under anti-syphilitic treatment.

[1] Goodhart: Path. Trans. 1877, p. 322.
[2] Rollet: Annuaire de la Syphilis.
[3] De Meric: Lancet, May, 1859.
[4] Curling: Diseases of Testis, 4th edit. 1878, p. 301. See also Zeissl: Vierteljahr. f. Dermat. u. Syph. 1875, p. 137; Marc Sée: Loc. cit.; Reynier: Archives Gén. de Méd. 1879, Avril.

The fungous form is far less frequently met with. It begins by nodular expansion of the testis at one part, which slowly increases for some weeks or months; then—usually when the patient has interrupted his treatment, or has received a blow or squeeze of the organ—the swelling rapidly increases, becomes a soft well-defined 'knob,' or 'boss,' which in Zeissl's[1] case attained the size of "a child's fist." The scrotum quickly becomes adherent to the swelling, and absorption of the surface and liquefaction of the interior follow. The gumma breaks at last and leaves a ragged cavity with gelatinous contents. In a few weeks the gelatinous matter is replaced by rapidly growing granulations that soon protrude from the interior and luxuriate as a soft red mass above the level of the scrotum, often overhanging the margins of the orifice, and secreting pus freely. The fungus consists of simple connective tissue, and sometimes contains also the special structures of the testis. If cut off, the mass often grows again rapidly, and needs several operations for its removal. Anti-syphilitic treatment has little influence over the fungus, hence some authors, Lorenzo[2] for example, maintain that the affection is not truly syphilitic, though set in action by the perforation of the tunica albuginea from syphilitic disease. Lorenzo has recorded three cases where the fungus was cured by actual cautery, after mercury and iodide had failed to influence the growth.

Termination.—When untreated, the enlargement of the organ in course of time subsides with atrophy and fibrous degeneration of the affected portion, but other gummata form again and again in the organ unless suitable treatment be employed. Sir A. Cooper[3] and Curling[4] relate instances of the enlargement returning many times. The testis sometimes ultimately shrivels to a fibroid mass very much smaller than the original organ. Wilks[5] has recorded such cases. We have also noted the case of a man whose testes enlarged, one after the other, seven years after infection. In course of time both became much shrunken, the right being no bigger than a filbert, and the left about half its original size. This patient had no sexual desire, and never attempted intercourse.

Pathological Anatomy.—Two distinct kinds of change take place:[6] inflammation of the fibrous structures; and the production of gummata. The first commences by congestion and thickening of the tunica albuginea at a few limited points on the surface, from

[1] Zeissl: Loc. cit.

[2] Giacomo di Lorenzo: Sul Fungo benigno del testiculo in rapporto alla Sifilide general. Giorn. Ital. d. Malattie veneree e d. pelle. 1875, p. 260.

[3] Astley Cooper: Loc. cit., Case iv., p. 105.

[4] Curling: Loc. cit.

[5] Wilks: Path. Trans., vol. x., p. 210, and vol. xii., p. 216.

[6] Virchow: Ueber die constitutionellen Syphilis. 1859. See also Lancereaux, loc. cit., p. 221, and Cornil: Leçons sur la Syph. 1879, p. 433.

which spring adhesions of the tunica vaginalis and effusion of fluid into the serous cavity. This inflammatory action passes inwards through the fibrous tunic to the substance of the testis, so that the fine laminæ of cellular membrane between the tubules, which are naturally very vascular, are converted into a soft cellular tissue crowded with nuclei. This new tissue contracts and indurates, whereupon the tubes alter, their walls thicken, lose their epithelial secreting lining, and shrink into an almost homogeneous mass. It is no longer possible to draw out the tubules, as may be easily done in the healthy testis. These changes, slow in taking place, are usually at first, and for some time, confined to one or two isolated lobules, and they do not generally affect the rete testis, or vasa efferentia. As the morbid action rarely affects more than a few of the lobules at first, and as the disease is commonly arrested by treatment before the secreting structure of the tubules is destroyed, the gland recovers its normal condition to a great extent. The inflammatory induration, if long-continued in the tunica albuginea, renders it thick and gristly, and the free surfaces of the serous coat become adherent.

Gummata.—These are not so frequent as the changes which have just been described. The gummy form of disease commences by the development of a hard nodule, where the tunica albuginea or one of the lobules of the testis has been previously indurated in the manner already described. The gummy masses, when recently produced, are surrounded by a vascular areola that becomes, when the masses have existed some time, a tough capsule. These areolæ consist of an irregular network of cellular tissue, enclosing a centre of dense fibrous tissue, in which cells that have undergone fatty degeneration are packed, and resemble those seen in the atheroma of arteries.[1] The gummy masses are not unlike tuberculous nodules in the testis, but they are more fleshy and elastic, and are distinguished by the absence of the miliary grey granulations, that can be often found round real tubercle, and by the fibrous or vascular capsule of the gummy growth. Wilks and Moxon[2] have found tubercle and gumma in the same testis; each with its proper characters.

Diagnosis.—When the case is seen at the beginning, the testis is uneven on the surface, but this irregularity may disappear in the general enlargement, and the organ become smooth and regular in shape. Pain is absent, and the sensibility of the gland is diminished. The cord and epididymis commonly remain unattacked, but in rare cases they do get thickened and involved with the disease;[3] but usually the epididymis is only more or less concealed by the enlarged

[1] A case of Canton's, Path. Trans., vol. xii., p. 163, and Wilks', Guy's Hospital Reports, 1863.
[2] Wilks and Moxon: Pathological Anatomy. 1875, p. 534.
[3] As in Lancereaux's case, loc. cit., p. 222.

testis. In most cases of syphilitic testis other symptoms are still present; if not, there is generally the history of past eruptions of the skin, sore throat, or other lesions, sufficiently deciding the origin of the disease.

Cases in which the nodular condition is present, may be confounded with tuberculous or cancerous disease, or with simple orchitis; but there are these distinctions. *Tuberculous disease* commonly begins in the epididymis; in syphilis that part remains almost always free from morbid change. As the tuberculous disease progresses, the nodules and irregular projections adhere to the scrotum and form abscess. The syphilitic testicle, if somewhat irregular at first, generally becomes smooth, and rarely forms connections with the scrotum, or causes abscess. Pain, though absent in the early stages of tubercle, is an accompaniment of its softening and suppuration. The pain in syphilis is always slight, being caused merely by the weight of the organ; thus it is felt less in the testicle than in the groin and back. In tuberculous testis the cord is often thickened, and the lymphatic glands of the groin enlarge when the scrotum is implicated, and the seminal vesicles, if examined per anum, are often found to be affected with similar disease. These changes do not take place in the syphilitic testis. Lastly, tuberculous disease occurs more often in youths than adults, but syphilitic disease is rare before 25 or 30 years of age.

Malignant disease of the testis is in its early progress more easily confounded with syphilitic testis. At first the testicle, and not the epididymis, is attacked; the surface is uneven, and pain may be absent; but as the disease advances the distinction soon grows clear, the projections of cancer rapidly enlarge, and the testis usually remains uneven, studded with masses firmer than the rest of the organ. The outgrowths in due time adhere to the scrotum, which reddens, ulcerates, and a protruding fungous surface developes. The pain in cancer long before this stage becomes stabbing and shooting in character, and often very great indeed. Cancer never remains stationary; the epididymis and cord soon become enlarged and uneven, and when the scrotum is much involved, the inguinal lymphatic glands are affected also. These changes are wanting in the syphilitic testis, which increases slowly and regularly, rendering the epididymis indistinct; but the cord is hardly ever reached, and the scrotum is in the great majority of cases left in its ordinary condition. Cancer very rarely attacks both testes, and its enlargements do not subside. Syphilis usually attacks both organs, one after the other, and its projections subside spontaneously in time. When both testes are attacked, there is usually other evidence which at once decides the nature of the malady. Cancer is com-

mon at a much younger age than syphilis; though seen at all ages, it prefers children and growing lads for its victims, in whom syphilis of the testis is rare.

Cystic enlargements are distinguished by fluctuation, or by being connected more with the epididymis and cord than with the testis.

Simple chronic Orchitis closely resembles the syphilitic form in its course and symptoms, and it is sometimes impossible to distinguish it from the specific enlargement. Fortunately in such cases, the treatment is very similar to that appropriate for syphilis.

Acute orchitis, epididymitis, hydrocele, and hematocele, are too readily distinguished to make any particular description of their differences needful.

Prognosis.—This is usually favourable, provided treatment be early and assiduously carried out, otherwise atrophy is the probable termination. The semen secreted by testicles which have apparently recovered from syphilis, often possesses no fertilising power.

The Testis in Inherited Syphilis.—Until a comparatively recent period specific disease of the testis in young children had been overlooked; even now the number of cases on record is small. Gosselin,[1] North,[2] Bryant,[3] Wilks,[4] and Keyes,[5] have reported single instances of enlarged testis in syphilitic children where recovery took place under mercury or iodide of potassium. Obédénare,[6] Henoch,[7] Hutinel,[8] and Bumstead and Taylor[9] have observed more numerous cases; and Henoch, Hutinel, and Cornil[10] have added an account of the histological structure of the morbid change.

The age at which enlargement of the testis has been noticed clinically, varies from two to fifteen or sixteen months; but Hutinel has found syphilitic change in the testes of children born before term, who only lived a few days. In one of Obédénare's cases on the other hand, the child was two years and a half old when the swelling was noticed. In most of the cases enlargement of only one testis is recorded. But Hutinel, in the post-mortem examinations of children under the care of Parrot, always found both organs involved to a greater or less degree. This observer also remarks that the testis is more often affected in inherited syphilis than is generally supposed:

[1] Gosselin: L'Union Médicale. 1858, p. 517.
[2] North: Med. Times and Gazette. 1862, vol. i., p. 403.
[3] Bryant: Med. Times and Gazette. 1863, vol. ii., p. 614.
[4] Wilks: Path. Trans. 1865, p. 189.
[5] Keyes: Van Buren on the Genito-Urinary Organs. 1874, p. 432.
[6] Obédénare: Cases reported on by Després in Bulletins et Mémoires de la Soc. de Chirurgie de Paris. 1875, p. 140.
[7] Henoch: Deutsches Zeitschrift f. Prakt. Med. 1877, No. 11.
[8] Hutinel: Revue Mensuelle de Méd. et de Chirurg. 1878, p. 107.
[9] Bumstead and Taylor: Venereal Diseases. 1879, p. 761; and Taylor on Bone Syphilis in Children. 1875, p. 16.
[10] Cornil: Leçons sur la Syphilis. 1879, p. 438.

and that such cases naturally escape notice during life because the microscope is necessary for the detection of the disease in its early stage.

The enlargement is gradual, and is mostly unattended by pain. The swelling is nearly always limited to the body of the testis, the epididymis and cord remaining free. In one of Obédénare's cases, however, where the child died with extensive visceral syphilis, the testes were examined by Cornil; and the right testis, epididymis and cord were all found to be diseased. The left testis was also altered to a less extent, although it had appeared to be healthy during life. The affected organ enlarges gradually, becoming smooth, firm and somewhat elastic, and may attain the size of a pigeon's egg, as in the case reported by North. The scrotum generally remains free, but is sometimes red and swollen; in two cases ulceration occurred with protrusion of a fungus testis. In one of these cases (that of Gosselin) perfect recovery took place under anti-syphilitic remedies and pressure; in the other case, that of Obédénare already noticed, death occurred. Hydrocele has been noted in several cases.

Pathological anatomy.—The changes of the testis in inherited syphilis resemble in many respects those of the acquired form of disease, though partaking of the diffused interstitial hyperplasia rather than of the circumscribed gumma. The tunica albuginea and the tunica vaginalis are but slightly affected. The small arteries coursing inwards from the tunica albuginea become beset with groups of rounded nucleated cells formed from the connective tissue in which the vessels are supported. This new development of the connective tissue stroma surrounds the tubuli seminiferi and by its abundance causes a notable enlargement of the organ. Presently this new product undergoes fatty degeneration and wasting, thereby inducing atrophy of the tubules themselves.

Diagnosis.—A slow painless enlargement of the testis in a young child is not likely to be mistaken for any other disease. Besides, there are almost invariably other signs of syphilis present with the testicular affection. Malignant disease is distinguished by its rapid growth and speedy invasion of the cord. Tuberculous disease, of which Henoch reports four cases, is very rare in young children; it begins in the epididymis, and is accompanied by pulmonary tuberculosis or affections of the bones.

Prognosis.—This is very favourable if the enlargement be discovered early and treated actively. In nearly all cases the swelling rapidly subsides under specific treatment, but if the change have made much progress before treatment is instituted, fibrous degeneration of part or the whole of the organ is very likely to occur.

Female Genitals.

The Vulva.—Besides the initial lesion of syphilis, the vulva is also frequently the seat of secondary, and sometimes of tertiary or late affections.

During the period of general eruption, *erosions* and *papules* are often present on the labia and nymphæ, and on the mucous membrane of the vaginal entry. The erosions are round, and usually of a bright red colour. They are quite superficial, and soon heal without other treatment than simple cleanliness.

Papules of the vulva are similar to the papules of the general eruption elsewhere, and differ from them only in liability to become eroded and sometimes ulcerated. This arises from their constant exposure to moisture. Thus, in this situation, as at the other orifices of the body, the papules frequently become converted into mucous patches.

Papules of the vulva often present a certain degree of induration about their bases, and then closely resemble the initial lesion, from which, indeed, in some cases, they can only be distinguished by their multiplicity, by the presence of other signs of syphilis, and by the history of the case.

Ulcers sometimes occur during the period of general eruptions in weakly women. The ulcers are apt to spread rapidly, and may cause considerable destruction of tissue. In the later stages of syphilis, *ulcers* are generally the consequence of the destruction of gummy nodules, or patches of diffused infiltration in every way identical with the formations occurring in other regions. The ulcer left by a broken-down gumma has some of the characters of the local chancre, and is not infrequently mistaken for it. But the gummy ulcer may be distinguished by its ragged cavity, and by the history of the case. There is no indolent enlargement of the nearest group of lymphatic glands, while there are traces of other signs of syphilis. The contraction of the scars left by such ulcers often causes considerable deformity, and may even altogether occlude the entry to the vagina.

Pseudo-Elephantiasis.—The vulva in syphilitic women is occasionally deformed by the irregular development of masses of connective tissue which not infrequently become pedunculated. This, however, is not an essentially syphilitic affection. The labia, nymphæ, fourchette and perinæum become prominent and thickened to several times their natural size. Oberlin[1] in an essay on œdema of the labia majora and minora, describes a condition of hypertrophy and

[1] Oberlin: De l'œdeme des grandes et des petites lévres symptomatique de la Syphilis. Thèse de Paris, 1879.

over-production of the connective tissue elements of the skin, characterised by the presence of umbilicated papules which are really hypertrophied hair-follicles. It is an obstinate affection, only to be got rid of by persevering anti-syphilitic treatment.

The Vagina.—Beyond the vulvo-vaginal orifice the vagina is very rarely the seat of syphilitic lesions. As has been remarked in a previous chapter, there is no clear case on record of the occurrence of the initial lesion on the vaginal wall. Of 522 cases of secondary lesions of the vulva noted by Fournier,[1] in only nine was the vagina affected, and in these cases the superior *cul de sac* was the seat of the eruption. We have never seen these lesions of the vagina in the portion intervening between the entry and the superior *cul de sac*. The early syphilides of the last named portion of the vagina usually appear as small flat papules, sometimes eroded on the surface, generally whitish or greyish-yellow in colour, but occasionally rosy red. The number of papules does not usually exceed half a dozen, but Fournier[2] mentions a case where there were ten, and Martineau[3] one where there were fifteen papules.

These lesions of the vagina do not give rise to any pain or inconvenience, and, as the speculum is necessary for their discovery, they are often overlooked. They disappear without treatment, and except for the fact that they are frequently the source of contagion, are of little importance to the patient herself.

Later affections of the Vagina.—The formation of gummy nodules in the vaginal walls has not yet been reported; but diffused infiltration, though not frequently selecting the vagina for its seat of development, is occasionally the cause of long-continued ulceration and subsequent contraction. In one case which came under our observation, the cervix uteri and the lower part of the vagina were closely bound together, and the latter was deprived of three-fourths of its length.

The vagina may be attacked also by ulceration and contraction extending to it from the rectum.

The Uterus.—The cervix uteri is occasionally the seat of the initial lesion of syphilis, but this is a rare occurrence. See Chap. III.

During the period of general eruption of syphilis, erythema, erosions, papules, and ulcers, similar to those of the mouth and throat, are occasionally discovered on the cervix uteri. These affections cannot always be distinguished from non-syphilitic ones, but there are some points that may help in forming a diagnosis. Thus, syphilitic *erosions* are often at a distance from the os, while

[1] Fournier: Syphilis chez la Femme, p. 548.
[2] Fournier: Ibid. p. 550.
[3] Martineau: L'Union Médicale, April 13 and 16, 1880.

the erosions due to metritis are immediately around it and radiate from it. The syphilitic erosions also are sometimes in circles or half circles, and this arrangement, if present, is very distinctive.

Papules of the cervix present much the appearance of papules of the mucous membrane in other parts. They are smooth on the surface, not infrequently eroded, and are mostly of a greyish-white opalescent tint. They may be single or multiple, in which latter case they generally tend to run together and produce irregular patches, in the same way as is frequently seen in the fauces.

Ulcers of the Cervix, when shallow, and occurring in the exanthematous period of syphilis, are generally only exaggerations of the erosion already mentioned. Deep ulcers are usually the consequence of *gummata*, which sometimes form in the cervix uteri of women who have syphilis of long standing. Contraction and various degrees of deformity of the parts may result from disintegration of the gummy formations.

The affections of the cervix just described, with the exception of gummata, disappear spontaneously, and give rise to little or no discomfort. They are much less commonly met with than an indurated and congested condition of the cervix, with granular ulceration around the os, and a glairy, or sometimes muco-purulent, discharge from the uterus. These affections, though frequent in syphilitic women, are nevertheless quite as common in non-syphilitic prostitutes, and, under certain circumstances, they are seen in married women in whom there is no suspicion of a syphilitic taint. Consequently such symptoms are not to be looked upon as essentially syphilitic, and will therefore be more particularly described among the non-syphilitic diseases of the uterus. It is probable, however, that these discharges in syphilitic women not infrequently contain the virus in a communicable form, and thus may be of great importance. They are very obstinate, and unless submitted to treatment may last for many years.

Under the title of 'exulcerative hypertrophy' of the cervix, Aimé Martin[1] and his pupil Fourcauld,[2] have described an enlarged indurated and congested condition of the neck of the uterus, with superficial ulceration, which comes on about three or four months after infection. Martin states that these changes were present in forty-seven out of ninety-seven women admitted into the St. Lazare Hospital during a period of eight months. Hypertrophy of the tonsils was also present in thirty-one of the forty-seven cases. The affection yields readily to general specific treatment. Martineau[3]

[1] Aimé Martin : Annales de Gynaecologie. 1877, Novembre.

[2] Fourcauld : Etude sur L'Hypertrophie exulcérative du col de l'Uterus dans la Syphilis sécondaire. Thèse de Paris. 1877.

[3] Martineau : Traité Clinique des affections de l'Uterus et de ses Annexes, 2e partie. 1879, p. 424 ; and L'Union Médicale, Mai 13 et 16, 1880.

states that he has frequently looked for the condition described by Martin, but has never seen it among the patients at the Lourcine hospital. We also are unable to find in the description given by those authors any features that warrant us in attributing to this affection a specially syphilitic nature. But it frequently happens that enlargement, induration, and ulceration of the cervix speedily recover under general anti-syphilitic treatment, even without local applications. Henry[1] has reported three cases of this kind.

The symptoms of uterine troubles in syphilis are those usually present in non-syphilitic patients, viz., pains in the loins and thighs, a sense of weight and discomfort in the pelvis, and more or less discharge, varying in character according to the nature of the lesion.[2]

Leucorrhœa.—A whitish, mucous discharge from the internal genital organs is not at all rare during the early eruption-period of syphilis. The discharge is probably not a direct result of the syphilitic poison, but of the general anæmic and debilitated state so common at this period of the disease.

The contagious or non-contagious nature of such discharges is a very important question. The safer view in these cases is to look upon the discharge as capable of conveying syphilis, because we are unable to ascertain the absence of ulceration from the internal mucous membrane of the cervix and body of the uterus. For it is an undoubted fact that the discharges of other ulcerated mucous membranes, the faucial for example, are contagious. It is true that Fournier[3] considers leucorrhœa without obvious lesions to be not contagious; he states that whenever he has been able to obtain satisfactory evidence of contagion he has, except in the rarest instances, found in the women, either well-marked primary or secondary lesions.

In later syphilis leucorrhœa is also frequent, but it presents no particular distinctions from the ordinary form.

Disorders of Menstruation.—In ordinary cases of syphilis, the majority of women do not materially suffer as regards menstruation. In some cases, however, especially if the attack be a severe one, the monthly flow is more or less influenced as in other diseases accompanied by anæmia. The menses may occur regularly, but with less loss of blood than usual; or the interval may be prolonged, in some cases over several months. Fournier[4] gives an instance in which a

[1] Henry: Amer. Jour. of Syphilography and Dermatology. 1874, p. 346.

[2] The following may be consulted for further information on syphilitic affections of the uterus:—G. Bernutz: Des affections syphilitiques de l'Uterus. L'Union Médicale, 1855, Juin 9; and Maladies des Femmes, by Bernutz and Goupil, 1862, vol. ii., p. 169. Becquerel: Traité des Maladies de l'Uterus et de ses Annexes. 1859, vol. ii., p. 462. Despeyreux: Etude sur les ulcerations du col de la matrice et sur leur traitement. Paris, 1872. Also the articles by Fournier and Martineau referred to in the text.

[3] Fournier: Loc. cit. p. 943.

[4] Fournier: Loc. cit. p. 950.

woman suffering from a severe attack of syphilis only menstruated twice in eleven months, and in another case there was an interval of thirteen months.

The effects of syphilis on *pregnancy* and its influence in inducing abortion and premature labour have already been noticed in Chapter II.

The Fallopian tubes.—Bouchard and Lépine[1] have recorded an instance of disease in these organs that probably had a syphilitic origin. A woman, in whom the usual symptoms of syphilis were not known to have occurred during life, died of paralysis and coma. At the post mortem a gummy nodule, the size of a pea, was found on the dura mater opposite the left parietal bone; beneath this the surface of the brain was of a pulpy consistence. The liver was much contracted, adhesions binding it to the diaphragm, and gummy nodules lying in its hinder part. Of the Fallopian tubes one was impermeable and as thick as the finger; in the other, three soft reddish masses the size of a hazel-nut lay imbedded. On section these were seen to be dotted with numerous greyish granules like grains of sand. The microscope showed the masses to consist of dense cellular tissue with nucleated cells.

The Ovaries.—Very little is known of syphilitic changes of the ovary. Richet[2] mentions the occurrence of disease similar to that of the testis and mamma; and Lancereaux[3] has figured an ovary from one of Richet's cases in which a soft dry yellow mass was found and considered by Lancereaux to be a gumma. This author also describes a diffused form of syphilitic ovaritis, and relates the case of a woman, aged thirty-three, who died from syphilis, and where, after death, one of the ovaries was found to be the seat of patches of white induration. The ovary was adherent to the Fallopian tube as well as to the surrounding parts. Klebs[4] ascribes to syphilis simple inflammatory thickening, causing contraction and adhesion of the ovary to neighbouring parts, but cites no case in support of his statement.

The Placenta in syphilitic women may be diseased in various ways. The most frequent changes are not pathognomonic of syphilis, being met with independently of any syphilitic contagion. They are, extravasations of blood into the placenta, and its consequences, viz., production of fatty degeneration and of caseous masses resembling tubercle. Such changes were described by Dubois, Lebert, Mackenzie and others. Still earlier than they, even Astruc remarked the frequency of abortion in syphilitic women, but these authors

[1] Bouchard et Lépine: Gazette Médicale de Paris. 1866, No. 41.
[2] Richet: Anatomie Méd. Chirurgicale. 2nd edit., 1860, p. 561.
[3] Lancereaux: Loc. cit. p. 229 and pl. i., fig. 6.
[4] E. Klebs: Handbuch der Path. Anatomie, IVter Lieferung. 1873, p. 826.

ascribed abortion to destruction of the fœtus by visceral disease, without insisting on the condition of the placenta being also a frequent cause of the interruption to pregnancy. In 1863 Wilks[1] published notes of nine cases observed by Wilkinson King, in which abortion took place, and a deposit of adventitious material was found in the placenta. In all these women there was a clear history of syphilis, and subsequently all bore living children when they had been treated.

The special changes developed are of three kinds. In the first, the most rare, the maternal portion is solely or chiefly affected: in the second, the fœtal portion is primarily and particularly the seat of morbid action:[2] in the last, the blood-vessels of the cord are mainly affected. All three forms may be detected in the same placenta.

The affection of the maternal portion was first correctly described by Virchow;[3] Oedmansson,[4] Slavjansky,[5] Kleinwächter,[6] and Fraenkel[7] have since recorded cases. From the paucity of the observations hitherto collected this would appear to be a very rare affection. It is designated by Virchow, '*Endometritis decidualis*,' and by others '*Endometritis placentaris gummosa:*' according to the origin of the disease in the decidual layer, or more deeply in the maternal placenta.

The character and structure of the new growth are thus described by Virchow:—The placenta, in other respects well developed, is invested on the maternal side by a somewhat close and thick decidual layer, from which, in several places, hard nodules of a wedge-shaped form sink into the substance of the placental lobules. These nodules consist of a whitish fibrous capsule containing a reddish or yellowish soft material. At certain places where the capsule has attained an unusual thickness, yellowish cheesy points may be observed. Slavjansky found that processes of fibrous tissue ramified from the nodules and anastomosed and divided in the fœtal placenta; they thus formed a loose network in which the villi were embedded. In Fraenkel's case the villi were more or less compressed as the fibrous processes formed a closer or more open network.

Microscopical examination reveals a close, large-celled connective tissue in which, here and there, copious collections of young cells

[1] Wilks: Guy's Hospital Reports. 1863, p. 59.

[2] Angus Macdonald has reported two cases of syphilitic placenta in which both the maternal and fœtal portions were affected. Brit. Med. Jour., August 21, 1875.

[3] Virchow: Krankhafte Geschwülste. 1864–5, Bd. 2, S. 480.

[4] Oedmansson: Nordiskt Archiv, I. 4, p. 73, and Archiv für Gynaekologie. 1870, S. 523.

[5] Slavjansky: Präger Vierteljahresschrift für die praktische Heilkunde. 1871, Bd. 109, S. 130.

[6] Kleinwächter: Präg. Vierteljahresschrift. 1872, Bd. 114, S. 93.

[7] Fraenkel: Credé u. Spiegelberg's Archiv f. Gynaekologie. 1875, Bd. 5, SS. 1–54.

are formed and pass into a state of fatty metamorphosis. The villi are so tightly enveloped by this tissue that their epithelium lies close against it. The structure of the villi themselves is not remarkably changed, the basement tissue is increased at some places and contains a larger number of cells than in the normal state.

Calcification of the new tissue also follows the course of the original capillaries of the villi, which are themselves injected with a dark material. A few of the capillaries may still be filled with blood-corpuscles. The epithelial mantle of the villi is fattily degenerated or lost, and in the denser parts it coalesces immediately with the thickened processes of the nodules, and thus becomes inseparably adherent to the maternal parts.

In all the cases, the extent of the gummy affection was very limited. Slavjansky found three, Kleinwächter in his four cases rarely more than two, and Fraenkel only two nodules. It is true that Hervieux[1] has reported a case where he found from fifteen to eighteen nodules, but it is not clear that some were not really masses of villous disease of a non-specific kind, and doubt was thrown on the correctness of the diagnosis by Depaul.

Mewis[2] describes two cases of which one was microscopically examined by Birch-Hirschfeld. In this case the mother had suffered from syphilis before her pregnancy. On the uterine surface of the placenta was a firm tumour the size of an apple, and hard to the touch. On section, a considerable amount of fluid blood escaped from the swelling, and a few gaping blood-vessels were seen. Along the base of the placenta coursed a blood-vessel as thick as the little finger, and the vessels generally were considerably widened. Under the microscope the tumour appeared to be of gummy structure. Its periphery was composed of a tissue rich in large oval nuclei and round cells, enclosing blood-vessels partly plugged with thrombi and partly dilated. The central parts of the tumour consisted of tissue containing nuclei and round cells closely packed together, and undergoing caseous degeneration. In the second case the condition of the mother is not stated, but the child was syphilitic, and several gummy nodules, some as large as a hazel-nut, were scattered in the fœtal part of the placenta.

Endometritis placentaris villosa.—The form in which the fœtal portion of the placenta is mainly and originally diseased, has been specially described by Fraenkel. The villi are the parts that are characteristically affected, but the placenta as a whole is altered.

[1] Hervieux : Bulletin de l'Académie de Méd. 1879, p. 880.
[2] Mewis : Zeitsch. f. Geburtshülfe und Gynaekologie. 1879, p. 61.

It is usually large, often exceeding thirty ounces in weight (fifteen to thirty ounces are the normal limits according to Flint), being increased both in circumference and thickness; and its tissue is tougher and more dense than it should be. The uterine surface of the placenta in this form as in the preceding, has generally an indistinct lobular marking caused by the irregular thickening of its decidual envelope. The amniotic membrane and the chorion are thickened and rendered opaque by the deposit of finely granular masses. They are here and there adherent to each other. Section shows the structure of the placenta at the diseased part to be somewhat homogeneous, though not of the gristly hardness that results from old extravasations of blood into its framework. The colour is pale yellowish-grey, resembling that of the brain; these areas of altered colour and consistence are not abruptly limited, but stretch in smaller bands or streaks to the fœtal surface. The great opacity of these districts of firm tissue is characteristic of the disease. The villous tissue between these yellow areas retains its healthy aspect, but becomes livid and much congested as it approaches the diseased districts. In the parts adjacent to, though not attacked by the special morbid induration, are patches of extravasated blood of different ages and stages of change, ranging from cysts filled with dark gelatinous fluid to yellow shining gristly tissue, creaking on section.

The umbilical arteries are usually normal in this form of placental disease. They may be atheromatous for a short distance from the placenta, or may be affected in their intima and adventitia in the same manner as are the arteries of other organs. This will be noticed again.

Microscopic examination shows that the villi of the chorion are thickened, opaque, and swollen, especially at their ends which are club-like. They are filled by an increase of the connective tissue elements, consisting of round, polygonal and spindle-shaped cells charged with opaque, finely granular contents. The proliferation of the cells appears to begin in the stem of the villus, and to extend gradually to its end. The cells are most closely packed along the course of the capillaries of the villus, and some of the cells have undergone degeneration, so that certain villi may be filled with fatty matter or detritus. In some transverse sections of villi, the vessels can be discerned to have thickened walls, and their lumen to be charged with blood-corpuscles. In a still further advanced stage, the walls are thicker and pressed together by the growing cells; the lumen is closed and deprived of blood-corpuscles. The last change affecting the vessels of the villi is their gradual destruction by degeneration of their coats until, as is the case in most villi,

all trace of the vessel is lost.[1] The epithelium of the villi is often absent; when present, it is much thickened by cloudy swelling and granular degeneration of its cells.

The villi that remain healthy are chiefly those near to the fœtal surface. Not infrequently even there, a fine fibrous stroma rich in connective tissue-cells, creeps among these villi and embeds them in a framework of cellular tissue.

The change in the placenta in this villous form of syphilitic disease, consists essentially in increase of bulk, weight and consistence, consequent on the dense and swollen condition of the villi. The change in the villi is produced by their distension with cells proliferated from the walls of their blood-vessels, and complicated with degeneration of the epithelial investment of the villus: ultimately, complete destruction of the villus is produced.

In the third form, the vessels of the *umbilical cord* are affected by thickening of the special kind already described in the chapter on the Circulatory System. Oedmansson[2] has examined six cases in which, besides advanced ordinary atheroma of the adventitia, thickening and calcification of the intima were marked in the umbilical arteries and vein, sometimes mainly in their trunks, in other cases extending into the branches as well. This widely-spread contraction of the arteries and veins mechanically impedes or even arrests the placental circulation. The body of the placenta in several of Oedmansson's cases had undergone the peculiar changes of fibrous thickening and circumscribed gummy development, described with greater precision by Slavjansky and Fraenkel. Birch-Hirschfeld[3] has also recorded similar cases of thickening of the umbilical vein in the syphilitic fœtus. Thus, as a cause of death of the fœtus, the syphilitic affections of the placenta take an important place; the birth of a living child when the placenta is affected in its larger blood-vessels or in the villi, being probably a rare event.

The Breast.

It was long thought that the breast was not liable to be attacked by syphilis. At the present time, however, although Billroth[4] and others consider the evidence still inconclusive, there are a sufficient number of cases on record to place beyond doubt the occurrence of syphilitic affections of the mamma. Maisonneuve, indeed, con-

[1] Hennig (Annales für Gynaekologie. 1874, Bd. vi. S. 141) showed to the Obstetrical Society of Leipzig three cases where the vessels of the villi were shrunken and thickened in their coats. He agreed generally with the description of Fraenkel and Slavjansky.

[2] Oedmansson: Loc. cit.

[3] Birch-Hirschfeld: Wiener Med. Wochenschrift. 1875, p. 555.

[4] Billroth: Deutsche Chirurgie. Billroth ü. Luecke. Lieferung, 41. 1880, p. 31.

siders gummata to be not very rare in the female breast, and is inclined to believe that many of the so-called cancers which disappear under treatment by iodine are of this nature.

As in other organs of the body, syphilitic affections of the breast may be considered under the two heads of Diffused Infiltration and Circumscribed Gumma.

Diffused infiltration.—The evidence of this form of disease is still imperfect, and very few cases have been recorded.

Ambrosoli[1] reports the following:

Case 1.—A woman, aged 19, was admitted into hospital with a primary syphilitic sore and enlarged inguinal glands on May 20, 1863. Local treatment only was resorted to, and the patient went out after fifteen days. On June 26, she returned with syphilitic erythema, for which mercury was prescribed. The patient then drew attention to her left breast, which she had noticed to have been getting larger for some days. On examination, the breast was found to be uniformly enlarged and hard, and about one third larger than the right. There was slight pain on pressure. The integuments were normal. The swelling disappeared under iodide of potassium. A few days afterwards the right breast became swollen in a similar manner, but also subsided under the iodide. Osteocopic pains, from which the patient suffered, also disappeared.

Case 2.—A woman, aged 24, came under treatment in January, 1864, for a papulo-pustular syphilide, mucous patches of the lips, and iritis, for which mercury was given. About three months after this the right mamma became uniformly enlarged and hard. The swelling was smooth and painful on pressure. The skin was unaffected. Under the administration of iodide of potassium the patient was cured in forty-seven days.

Lancereaux[2] states that he has seen a case somewhat similar to those of Ambrosoli; but he thinks—and in this view we concur—that more numerous observations are necessary to prove beyond doubt the existence of this form of disease.

Gummata.—These have been observed in the mammary region of both women and men. They may occur in the subcutaneous cellular tissue, or in the substance of the breast itself.

In 1855 Verneuil[3] showed to the Société Anatomique, a tumour from the mammary region of a man who had been under the care of Rostan. The tumour was six centimetres in diameter and three centimetres thick, and was considered by Verneuil to be a gumma. The man had also gummata of the testis, muscles, and skin.

Velpeau[4] mentions four cases observed by Maisonneuve. In one there existed a simple gummy tumour without ulceration of the skin; in the other three the skin was broken. In all four there were other signs of syphilis, and all were promptly cured by preparations of iodine.

[1] Ambrosoli: Gazzetta Med. Italiana. Lombardia. 1864, p. 312.
[2] Lancereaux: Loc. cit. p. 187.
[3] Verneuil: Bulletin de la Soc. Anatom. 1855, p. 98.
[4] Velpeau: Traité des Maladies du Sein. 2nd edit. 1858, p. 534.

Richet[1] describes a syphilitic tumour of the breast similar to that which occurs in the testis, and which at the beginning presents all the characters of scirrhus. This author also states that in one such instance he was on the point of removing the breast when he accidentally discovered another tumour in the calf of the leg. This induced him to wait until specific treatment had been tried, the result being the simultaneous disappearance of both tumours.

Yvaren[2] mentions a case where an enlargement in the breast of a syphilitic man was dissipated by specific treatment; and Ambrosoli reports a swelling in each breast of a man during the early stage of syphilis, which disappeared in a month under iodide of potassium. Lancereaux[3] also has observed an instance in a man; and another, but somewhat doubtful case, has been published by Cheever.[4] Hennig[5] found in a woman aged 55, whom he had not seen during life, but who had suffered from syphilitic ulcers, a swelling in each breast considered by him to be of a gummy nature. One of the tumours was caseous in its centre. Lang[6] records the case of a woman, aged 39, in whom a tumour the size of an egg developed in the right breast at the same time as gummy deposit in the palate. The breast became normal under mercury and iodide of potassium.

A gumma of the breast is a well-defined swelling that usually developes painlessly and attracts attention only when it has acquired a certain size. The skin is free at first, but eventually, if untreated, becomes adherent and red, and finally breaks, allowing the escape of the gummy material, and leaving an ulcer of the usual character.

Diagnosis.—The only affections likely to be confounded with gumma are cancer and adenoma. In cancer there is pain, sometimes very acute and darting in character. The gradual implication of the integuments and other neighbouring structures, glandular enlargement, and retraction of the nipple are also important distinctions. The diagnosis of gumma from adenoma presents more difficulty; but the history of the case, the antecedents of the patient, and the presence or traces of syphilitic disease elsewhere will generally decide the question. Failing these, the effect of anti-syphilitic remedies must be awaited.

The Prognosis is very favourable, resolution speedily taking place under anti-syphilitic treatment.

[1] Richet: Anatomie Méd. Chirurg. 1860, p. 561.
[2] Yvaren: Métamorphoses de la Syphilis. P. 432.
[3] Lancereaux: Loc. cit. p. 187.
[4] Cheever: Boston Med. and Surg. Journal. 1879, March 20.
[5] Hennig: Archiv für Gynaekologie. 1871, p. 350.
[6] Lang: Wiener Med. Wochenschrift. 1880, Feb. 28.

SYPHILIS.

CHAPTER XII.

THE OSSEOUS SYSTEM.

In the early period of syphilis pains occur in the bones. They are termed *Ostealgiæ*, or *dolores osteocopi*, when no definite symptoms beyond pain and tenderness are developed.

Ostealgia consists in violent aching intermittent pain, sometimes attacking the patient only at night, more often by day also, but worse at night. The nocturnal exacerbation is attributed by some to the warmth of the bed increasing the circulation of the blood through the capillaries of the surface; others assign some peculiar meteorological influence of the daily cycle as the cause. Patients whose occupation compels them to work at night and sleep by day, commonly, though this rule has exceptions, have the time of severity altered from night to day, the pain being most intense by day, but subsiding when night approaches.

The points where pain is felt are scattered over the superficial bones. Those most often attacked are the frontal bone, sternum, clavicle, ulna, and tibia, pretty much those selected for the growth of nodes, of which they are probably only ill-developed forms. When these pains manifest themselves at the outset of the disease, they usually cease when the cutaneous eruption is fairly out.

Early Periostitis.—True nodes now and then form at this early period. Bassereau[1] mentions a young man who, three months after infection, had a vesicular syphilide widely spread over the body, accompanied by agonising pain at the left parietal eminence, where presently a round slightly fluctuating tumour formed. It subsided after fourteen days of mercurial treatment, though nocturnal pain appeared elsewhere, notably in the knee. Similar cases are mentioned by others.[2]

[1] Bassereau: Affections de la Peau symptomatiques de la Syphilis. 1852, p. 395.
[2] Lancereaux: Loc. cit. 1873, p. 154.

The following is a good instance of the kind: Among my out-patients of October, 1864, J. K., 22, house-painter, presented himself with the indurated scar of a sloughing chancre, that had healed before hardening, and had been treated at another hospital. When he applied to me, he had a papular, scaly, and pustular eruption, enlarged glands of the neck, a painful circumscribed oval swelling on the shaft of the left ulna, pain and tenderness without swelling, at one point of the forehead, beside severe headache, and flying rheumatic pain elsewhere. All the symptoms were rapidly alleviated by mercury, and completely disappeared with the continued use of that medicine. From then till the autumn of 1865, he was free from symptoms; in the spring and winter of 1866, and in June, 1867, he had relapses of his periosteal pains. In other respects he has had fair health since his first attack.—In this case, the node formed probably within three months after infection.—B. H.

Mauriac,[1] in an essay on this subject, has reported a considerable number of cases. The precocious affections of the osseous system appear most frequently on the inner surface of the tibia, on the bones of the skull, the ribs, clavicles, bones of the fore-arm, and lower jaw; but any part of the skeleton may be attacked. The period of liability to pain is short-lived, lasting only a few weeks, three or four, if not treated, and a much shorter time if anti-syphilitic remedies are given. The peculiarities of this precocious periostitis are, its termination by resolution, affecting only a small area, and leaving no thickening or new growth of the bone. The periostitis may appear very soon after infection. In one of Mauriac's cases, nodes were detected on the forehead twenty days after the appearance of the initial lesion; in another patient, the tibia was affected about forty-five days after contagion.

Both adults and infants suffer from early periostitis; though in the latter it is more usual to have morbid changes extending through the bone than circumscribed periosteal inflammation.

This variety of periostitis is recognised by the following:—(1) in most cases the patient has still the signs of the initial lesion; (2) there are usually several nodes or painful spots simultaneously developed; in late periostitis, on the contrary, the affection is frequently limited to one bone; (3) the swellings have a limited area; lastly, the nodes are rapidly subdued by treatment.

The symptoms vary with the site of the nodes, but the pain is tolerably severe in all cases. In those situate on the skull, headache, aggravated at night, is the prevailing symptom. Where the swelling of the periosteum forms at the outlet of a nerve, the supra-orbital, for example, the pain is often agonising, and may even produce delirium. On the ribs, or costal cartilages (costal neuralgia), the pain is so much increased by muscular action, that it causes a 'stitch in the side,' and thus suggests pleurisy, or by preventing the

[1] Mauriac: Mémoire sur les Affections syph. précoces du System osseuse. Paris, 1872.

movements of the muscles of respiration, may give rise to a form of dyspnœa, or præcordial oppression. When developed along the sternum, the movements of the upper extremities often cause much pain. Wherever situated, these swellings are extremely sensitive, very slight pressure often producing a sharp outcry. The enlargement over the tender spot may be soft, almost fluctuating, or firm, as if composed of solid bone. When subsiding, the pain first departs, then the tenderness, and lastly the swelling, which may nevertheless remain for some time.

When, the more usual course of events, the periosteal affections are delayed, four or even more years elapse before the bones are attacked. In this case, as already mentioned, the affection is commonly limited to a single bone, and the bone itself is involved more or less deeply.

The bones of young children are affected by syphilis as well as those of adults; Woodman[1] found nodes on the bones in five per cent. of 200 cases of inherited syphilis. The former have in addition a peculiar affection—to be presently described—which is believed not to occur in persons who have passed early childhood.[2] The late forms of bone-disease in inherited syphilis are most frequently developed in more advanced childhood or adolescence, between the eighth and eighteenth years. Hutchinson[3] has pointed out some differences between the nodes of acquired and those of late inherited syphilis. In the latter form of the disease, the skull and clavicles are seldom affected. The nodes are almost invariably multiple, often symmetrical, frequently not accompanied by nocturnal pain, are not as a rule much influenced by iodide of potassium, disappear spontaneously, and are not infrequently so large that they are mistaken for malignant disease.

Morbid anatomy.—Two processes, acting in various ways, produce the changes met with, both beneath the periosteum and in the bony tissue. The first is slow irritative inflammation; the second, is a special development of gummy outgrowth. The inflammatory process is often at work without the other; but gummy growths always call the first into action in the parts about them. The bone and its investing membrane are similarly attacked and must be considered as inseparable, though one part is often more affected than another, and thus distinctions between them have been made. The products of these changes may be imperfectly arranged as subperiosteal swellings of the surface of the bone, or *nodes;* osteomyelitis leading to caries and necrosis of its substance—both in-

[1] Woodman: Congenital Lues. Trans. of the St. Andrew's Medical Graduates' Association. 1874. [2] Greenfield has recorded an exception. See p. 351.
[3] Hutchinson: Illustrations of Clinical Surgery. 1876, Fascic. 3, p. 47.

flammatory processes—and special *gummy outgrowths* of the bone or of the periosteum.

Nodes.—A small area of the periosteum, in its vascular layer next the bone, becomes red and congested; the contiguous vessels of the bone itself are also engorged, and contribute their share to the change about to take place. Presently, the membrane at this inflamed area is thickened, and lifted from the bone by serum and by a new formation of cellular tissue similar to that of granulations. Swelling results, which is often fluctuating and extremely tender when handled. In a short time the swelling becomes firmer and larger, forming a protuberance generally oval in shape, and varying from the size of a bean to that of a segment of a small orange. The margins of the swelling are lost in the surrounding tissue. The congestion may altogether subside in a short time, and the fluid disappear. Usually, however, the bone beneath the swelling is thickened during the chronic congestion of its tissue, by the layer of ill-organised cellular granulation tissue becoming converted into a plate of rough, hard, ivory-like bone (syphilitic exostosis). During this, the ordinary process, acute inflammation may set in, when the skin grows red and hot, and the pain much increases. The swelling then becomes an abscess which, if opened, leaves a very obstinate and irritable ulcer, and necrosis of the exposed bone.

The bones may also be involved in the extension of the syphilitic process from any other neighbouring tissue in which tertiary changes may be active. Such action can produce limited necrosis of a bone through its nutrition being destroyed by ulceration of the superjacent parts. The commonest examples of this are the thin bones of the hard palate or nasal passages, and the laryngeal cartilages. More rarely, thin layers of the tibia or of the frontal bone are so destroyed. Periostitis is often set going beneath chronic syphilitic ulcers of the skin if they happen to spread over a subcutaneous bone, in which case the bone gets thickened by a permanent layer of dense, rough, osseous material.

Osteo-myelitis.—Changes of structure within the bone, as on the surface, always begin in the vascular tissue, in the medullary lining of the Haversian spaces, canals, and cancelli.—These irritative processes produce rarefaction of the bone by diminution of the tela ossea and proliferation of the medulla. Later, degenerative changes ensue, such as condensation, calcification, or even limited necrosis, caries, and suppuration. These, however, are not distinctive of syphilis but only ordinary results of chronic inflammation. The bone itself becomes larger, thicker, and rough on its surface.

Dry caries is a form of bone disease which is peculiar to syphilis. It consists in a circumscribed wasting of the bone. No fluid forms

between the periosteum and bone; the latter separates from the periosteum by absorption, forming a pit or depression which can be felt through the skin. This form occurs chiefly on the frontal and parietal bones. In the bones of the head the change often begins at isolated spots on both surfaces of the bone,[1] proceeding most rapidly and extensively at the external surface. Action commences by the processes of cellular tissue which pass into the medullary canals from the pericranium or endocranium increasing in size, while bone tissue is cleared away before them.[2] Presently a shallow, funnel-shaped pit is formed on the surface of the bone, filled with a tissue consisting more of cells than fibres. Besides this pit, the canals radiating from the starting-point are opened up in a similar manner, and those lying on the surface are converted into tortuous grooves. A bone so altered, presents, when macerated, the worm-eaten appearance of the skulls preserved in the museums. This is not the only change. While this excavation and tunnelling is going on, a change of opposite character is developed in the osseous tissue of the neighbourhood: condensation takes place there, the cavities are filled with calcareous matter, and the thickness of the bone increases by rapid development of smooth hard bone on its surface. By this means an irregular wall or elevation is formed around the excavation, of sufficient height, in some cases, to be readily felt through the scalp. The tunnelling and the condensation round the tunnelling are not confined to the more superficial parts, but spread through the whole thickness of the bone, obliterating the distinction between table and diploe, causing, it may be, perforation from the inner to the outer table or *vice versâ*, according to the original starting point of the morbid change. Gummy nodules often occupy some of the hollows excavated by the dry caries, out of which they may project above the surface, and form even large masses. When this is the case, their coverings slowly ulcerate, allow the gelatinous matter to escape, and leave rugged cavities in which the parts of the bone that have undergone condensation remain firmly adherent to the skull, without possessing sufficient vitality to form new bone for closing the hollow. In this way necrosed patches may remain open for many years. Sometimes, however, the dry caries does not begin until the gummy deposits are undergoing disintegration and re-absorption. The termination of these affections is usually long deferred if left to nature; but unless far advanced, they rapidly yield to treatment.

[1] Virchow: Ueber die constitutionellen Syphilis. 1859.

[2] Soloweitschik (Virchow's Archiv, 1869, Bd. 48, p. 217), attributes much of the hollowing of the surface of the bone to absorption through the pressure exerted on it by new fibrous or gummy growths of the periosteum.

The specific gummy growth is often associated with the preceding inflammatory processes. The anatomical changes are then somewhat different, and the course is a slower one. In this form the newly-created tissue varies from the consistence of liquid glue to that of cheese, and is composed of a mesh-work of fibres, the spaces of which are filled with cells undergoing fatty degeneration, and serous fluid. This new tissue degenerates in three ways: (1) it may shrink into fatty opaque masses after the fluid part is absorbed; (2) it may almost wholly liquify into puriform fluid and be accompanied by suppuration and abscess, as before described; lastly (3), it may be slowly reabsorbed, its place being taken by more active cellular tissue which ossifies into bone. Thus the presence of gummy formations along with the periosteal or osteal inflammation, does not necessarily affect the final result. The gummy tissue is destined to destruction, and its presence excites changes of a more active kind, which furnish the prominent symptoms of the affection. Violent inflammatory action is not, however, always the consequence of gummy periostitis. It often begins first; and these gummy nodules, or collections, form in the midst of the ordinary irritative inflammation.

Necrosis and ulceration are not the invariable accompaniments of these slow changes in the bone; periostitis may thicken the bone for a considerable part of its length or breadth, and render it even double its natural thickness,[1] or form prominent tumours, which nearly encompass the bone. In a young woman, suffering from long-standing syphilis, the frontal bone expanded into a mass several inches across, by gummy formation in the diploe. It was checked and diminished from time to time, but was never entirely removed; eventually it caused the patient's death.[2]

The foregoing shows that the syphilitic process is almost wholly confined to producing fibrous tissue and new irregular bone; suppurative inflammation is excited only when some of the old or new bone dies, and irritates the living tissue like a foreign body.

Course and Symptoms.—Nodes are best perceived on the subcutaneous parts of the bones. They are observed most frequently on the shin, the collar-bone, the frontal and other bones of the skull, the ulna, and the ribs. Within the skull, the node forms sometimes between the endocranium and the bone, making a projection beneath the dura mater. Pain is usually the first symptom of a node, and may continue some weeks before any swelling at the painful part shows that morbid action is going on. This pain is aching, acute, often throbbing, sometimes even agonising. Like the early rheu-

[1] Virchow: Krankhafte Geschwülste, Bd. 2, S. 405.
[2] Boys de Loury: Gaz. Hébdomadaire. 1860, p. 632.

matoid pain, it is generally increased at night. On the other hand, unlike that, it is accompanied by tenderness of very marked kind at the seat of pain. Besides pain from the local action, severe pain is sometimes the consequence of an enlargement of the bone pressing on a nerve trunk; the superior maxillary nerve is thus sometimes compressed by a node in the infraorbital canal, and paralysis of the muscles of the face occasionally results from disease of the petrous part of the temporal bone compressing the facial nerve.

When the cranium is affected, the growths usually bring on interference with the functions of the brain; by giving rise to cerebral pressure or irritation, they may cause convulsions, coma, or hemiplegia. These have been more specially referred to in describing the affections of the brain and nerves.

Considerable mischief may ensue from destruction or injury of various parts of the skeleton. This is most frequently observed in the delicate bones of the face. Chauvel[1] relates a case of caries of the ethmoid bone causing death by secondary inflammation of the brain. Hutchinson[2] showed to the Medical Society of London an example of the extent to which this destruction may reach. In this case all the upper jaw-bone except a small portion of the antrum, the whole vomer, most of the ethmoid and all of the spongy and nasal bones were destroyed. The soft parts connected with them were also almost wholly destroyed. The preceding example was in an adult whose infection had been acquired; but the same destructive effects may be produced in the tardy forms of inherited syphilis in later childhood. Cheadle[3] has observed a case, in a girl of eight years old, who was born with active syphilis and had suffered from various affections during infancy. The bridge of the nose was destroyed, the nose flattened almost level with the face; and the nostrils were much contracted. Periostitis or osteitis of the nasal or lacrimal bones, or of the ascending process of the superior maxilla, may cause inflammation and obstruction of the lacrimal passages and further disfigure the face.

Richet[4] has recorded some cases in which specific remedies reduced the syphilitic thickening, but lacrimal fistula remained which required surgical treatment.

In a patient recently under my care, a man of 45, infected seven years before, the gummy osteitis extended from the cavity of the nose, where it had destroyed the vomer and parts of the spongy bones to the ascending process of the maxilla, producing general brawny swelling of the left side of the face near the

[1] Chauvel: Gazette des Hôpitaux. 1876, p. 979.
[2] Hutchinson: Lancet. 1874, vol. i., p. 233.
[3] Cheadle: Brit. Med. Jour. 1880, Feb. 7.
[4] Richet: Gazette des Hôpitaux. 1878, Oct. 17.

nose, with sanious discharge from the left nostril. Suddenly the left lacrimal sac was distended so as to form an elastic tender swelling, well defined from the slow general enlargement which had preceded it. The lacrimation which followed subsided when the gummy thickening had been removed by iodide of potassium, and the subsequent falling in of the bridge of the nose was not great.—B. H.

Richet[1] also records a case of gummy disease of the maxilla causing expansion of the antrum, without affecting the alveolar portion of the bone.

Verneuil[2] has called attention to the possibility of gummy disease of *the vertebræ* causing collapse of their bodies and projection of their spines with other symptoms of Pott's disease. In the cases hitherto recorded the diagnosis from ordinary caries was made mainly from the history of the case, and the effect of anti-syphilitic treatment. Verneuil, in the clinical lecture from which we quote, was able to exhibit a preparation sent to him by Fournier,[3] where the vertebræ were affected by gummy infiltration. Lomikovsky[4] has also reported an example of gummy swelling, the size of an hen's egg, growing from the spinous processes of the eleventh and twelfth dorsal and of the first and second lumbar vertebræ in a male, thirty-five years old, two years after infection. Post mortem there were found also gummata of the liver and of the right side of the thalamus opticus. Beck[5] relates an instance where necrosis was produced by gummy disease of the upper part of the spinal column; the patient, an adult infected nine years previously, after much pain and stiffness in the neck, coughed up the whole anterior portion of the body of the axis and subsequently recovered.

Bruck[6] has recorded an example of limited necrosis of the right iliac bone near the crest setting up caries and suppuration in a patient who had syphilitic disease of the skull, meninges and viscera.

Diagnosis.—The structural changes of the periosteum and bones of adults in syphilis are usually easily distinguished from those produced by other causes. They attack the superficial bones, and the shaft and denser parts rather than the articular ends or cancellous parts. They are slow in progress, accompanied by much pain, and last a very long time. They are common in middle life, when scrofulous affections are rare. Their processes of ulceration and induration

[1] Richet : Gazette des Hôpitaux. 1879, Juillet 15, No. 81.
[2] Verneuil : Gazette des Hôpitaux. 1879, Fév. 4.
[3] Fournier has recently reported the case in detail. Besides the disease of the vertebræ there was also a gumma on the fourth lumbar nerve. Annales de Derm. et de Syph. 1881, Janvier.
[4] Lomikovsky : Archiv für Dermatologie ü. Syphilis. 1879, p. 337.
[5] Beck : Dublin Journal of Med. Science. 1877, vol. i., p. 189.
[6] Bruck : Allgem. Wien. Med. Zeitung. 1873, March 18.

distinguish them from malignant disease or general softening (osteo-malacia).

Fragility of the Bones.—In syphilis, the bones are occasionally very easily broken. Cases are recorded where the long bones in syphilitic children have been fractured during the expulsion of the child in parturition,[1] or after birth by the nurse's ordinary manipulations.

A syphilitic child, six weeks old, with snuffles and pemphigus of the hands and feet, was recently under my care with fracture of the left humerus, which, according to the mother's account, had been caused by her catching the arm in a hole in the towel with which the child was being dried. When the child was examined, the right clavicle was bent and thickened with callus near its middle, where it had been broken at some time unknown to its mother. The fractured bones united in the usual manner.—B. H.

Similarly in adults the bones occasionally give way under a trifling strain. Taylor[2] records that one of his patients broke his femur while turning in bed. In these cases the bone has been rendered porous by previous osteo-myelitis.

The Cartilages.—The cartilages most frequently attacked by syphilis are those of the larynx and trachea, of which examples have been already mentioned in the chapter on the Respiratory System. The costal cartilages also are occasionally the seat of nodes. The fibro-cartilages have not yet been observed to be affected. The articular cartilages are probably only attacked by extension from the synovial membrane.

Syphilitic Dactylitis.—This affection occurs both in acquired and in inherited syphilis. It seems to have been first distinguished by Chassaignac[3] and Nelaton.[4] Other writers, especially Bergh[5] of Copenhagen, and Lücke[6] of Berne, more particularly described it, while Taylor[7] of New York has most fully set forth the clinical aspects of this affection. We are indebted to the last writer for much of the following description. The morbid anatomy remains unknown, but the change is probably similar to that which occurs in other long bones.

The acquired form of dactylitis is divided by Taylor into two varieties: First, that in which the subcutaneous connective tissue

[1] Porak: Gazette Médicale de Paris. 1877, p. 558.
[2] Bumstead and Taylor. 1879, p. 685.
[3] Chassaignac, quoted by Lancereaux, loc. cit. p .217, from the Clinique Européenne. 1859, Juillet 23, p. 239.
[4] Nelaton: Gazette des Hôpitaux. Fév. 1860.
[5] Bergh: translated from the Danish in Behrend's Syphilodologie. 1861, III. 3, and Archiv f. Dermat. und Syphilog. 1870, II. 2, S. 223.
[6] Lücke: Berlin Klin. Wochenschrift. 1867, Nos. 50, 51.
[7] Taylor: Amer. Journ. Syphil. and Dermatology. 1871. Brown-Sequard's Archives, 1873, and Bone Syphilis in Children. New York, 1875. Bumstead and Taylor: Venereal Diseases. 1879, pp. 671 and 770.

and the fibrous structures of the joints are involved. Second, that in which the process begins in the bones and periosteum.

In the first form, the lesion comes on slowly, and first attracts attention by the slight enlargement of one or more fingers or toes, the nails nearly always remaining intact. When the toes are affected, their whole length generally suffers, but in the fingers the proximal phalanx is almost always the first attacked, and the disease may not extend further, or may involve the second, and sometimes also the distal phalanx. In Nelaton's [1] case a man, aged fifty, had enlargement of the middle finger of the right hand, the first phalanx being principally affected, the second to a less degree, while the third was almost normal. The affected finger or toe is bluish-red in colour, and is firm to the touch; the thickening is generally most perceptible on the dorsal aspect. The swellings are usually developed slowly and without pain, but sometimes dull aching is present. In most cases the bone is only superficially implicated. Flexion of the joints is impeded by the swelling, and when the middle or ring-finger is affected, the neighbouring digits are thrust aside in a very characteristic manner. Subsequently, in the absence of treatment, the joints become unnaturally movable. There may be also slight effusion into the synovial cavity as well as crepitation.

The second form may begin either as in periostitis or osteo-myelitis. The shape of the swelling depends upon its seat. When the first phalanx is involved it may assume the shape of an acorn; the second and third phalanges may be fusiform or cylindrical. The whole bone is generally involved. The fingers are more commonly attacked than the toes, but both fingers and toes may be affected at the same time.

The metacarpal or metatarsal bones may become enlarged with or without dactylitis as well. Either end of the bone may be affected. The metacarpal bones of the thumb and index-finger are those most frequently diseased. The skin is rarely infiltrated in this form, but when the swelling is excessive, the integument becomes tense, and if the swelling is rapid grows red and inflamed. In some cases ulceration takes place, or incision is necessary to relieve tension, in which case a soft cheesy detritus mixed with pus escapes. Though limited necrosis may occur, resolution of the bony swelling takes place in most cases. When the bone has been previously attacked, the ligaments and other structures about the joint thicken, and thus impair movement, or render the bones more movable than natural.

[1] Nelaton: Gazette des Hôpitaux. 1860, p. 105.

The gummy deposit may be absorbed, or may soften and break down. After necrosis much shortening of the digit may be produced, but usually the deformity is slight. Taylor[1] figures a case where the index-finger was so much shortened that its extremity scarcely reached the first phalangeal joint of middle finger. In such cases the contiguous bones are always connected by a fibrous band after the absorption process has ceased. Pain is very slight, or may be absent. Bumstead and Taylor have never seen the tendons or their sheaths affected. In Nelaton's case, however, the sheath of the flexors seemed to be involved.

Syphilitic dactylitis is a late affection, usually occurring between the fifth and fifteenth years after acquirement of syphilis. Bumstead and Taylor, however, have seen a case which developed eighteen months after infection. In one of Taylor's[2] cases the patient was a young child (age not given) who contracted syphilis from her baby sister. The second metacarpal bone of the right hand was the seat of the affection. On the other hand, Galazzi[3] has published a case in which the affection appeared thirteen years after infection in a woman 32 years of age. The middle finger of the right hand was first affected, the first and, to a less extent, the second phalanx being involved. The metacarpal bones of the thumb and index-finger subsequently suffered.

Diagnosis.—The history of the case is most important, but evidence of syphilitic disease elsewhere will rarely be wanting. The absence of pain and inflammation distinguishes syphilitic dactylitis from paronychia and gout. In enchondroma and exostosis the swelling is more localised than in the syphilitic affection, and the soft parts are usually not implicated.

The Prognosis depends greatly on the recognition of the true nature of the affection. Treatment is effective when early; but less successful if the affection has lasted for a considerable time.

In inherited Syphilis children are attacked by dactylitis of the same kind as that of adults. The proximal phalanges are most frequently attacked, but all three phalanges may suffer, as well as the metacarpal and metatarsal bones. Archambault[4] has recorded a case in an infant where all the distal phalanges were attacked, the others remaining free. In such cases the fingers have a clubbed appearance. Bulkley[5] has reported cases, in which the proximal phalanges were affected, while Taylor has seen three cases in which

[1] Taylor : Amer. Jour. of Syphilography and Dermatology. 1871, January, p. 13.
[2] Taylor : Bone Syphilis in Children. 1875, p. 27.
[3] Galazzi : Annali Universali. Sep. 1877. See also Lond. Med. Record. Nov. 1877.
[4] Archambault : L'Union Médicale. 1869, No. 140. Quoted by Taylor, loc. cit. p. 43.
[5] Bulkley : New York Med. Jour. May, 1874. See also cases by Curtis Smith : Amer. Jour. of Syphilog. and Dermatol. Jan. 1872.

the middle phalanx suffered. Through this affection the bones may be enlarged to twice or thrice their natural size. One or more bones of one hand or of both hands may suffer. Bumstead and Taylor mention a case where all the phalanges of both hands were involved. The swellings progress slowly or rapidly. In the early stage the skin is normal; but later on, inflammation takes place in the soft parts and abscess forms.

Though usually seen in very young children, it occasionally occurs much later; thus Keyes[1] mentions the case of a boy aged 16 who had dactylitis which was thought to be due to inherited syphilis. Wigglesworth[2] reports the case of a girl, aged 18, suffering from tertiary syphilis, which was probably inherited. The great and second toes of the right foot, and the first phalanx and joint of the left ring-finger were the parts affected. Volkmann[3] also gives a case in which dactylitis appeared in a woman with inherited syphilis after her twentieth year. At the earlier age the affection is more inflammatory, while at the later period the swelling is due to gummy infiltration, and resembles the affections of the acquired disease.

When uninfluenced by treatment, dactylitis runs a very chronic course. In some cases, according to Taylor, resection of the bones is required; but generally the change is more extensive in the skin than in the bones; and cases apparently hopeless often yield to treatment without operation. At the termination of the disease, the shape of the phalanx may be restored, or it may be lengthened, or even very much thinned and shortened as in the acquired form.

In two cases of dactylitis, observed by me at University College Hospital, the children were two years old and seventeen months old respectively. In the elder the metacarpal phalanx of the second digit on the right hand was attacked; in the second child, the second phalanx of the fourth digit on the left hand. The enlargement was ovoid, apparently occupying the whole of the phalanx, though not affecting the articulations. Flexion was much impeded by the swelling, nor could the finger be quite straightened. Movements of the finger caused no pain, but they were abruptly arrested at a certain point. The integuments were unaltered in colour over the swollen phalanx, though the skin was stretched and slightly shining. The patients were not obviously affected with syphilis elsewhere, but the elder child had had snuffles, and sores on the buttocks and thighs, when two months old. Her mother had had three miscarriages before the child was born. The child was treated with grey powder and iodide of potassium, and rapid improvement followed. At the end of one week the movements of the finger were more free; in three months, the swelling of the phalanx was so diminished that it no longer retained the egg shape, but was simply somewhat thicker and firmer than its fellows. In six months, the finger was slightly smaller than the others, owing probably to arrest of growth. The second child had

[1] Keyes: Archives of Dermatology. 1874, p. 44.
[2] Wigglesworth: Amer. Jour. of Syphilography and Dermatology. Jan. 1872.
[3] Volkmann: quoted by Taylor. Ibid. Jan. 1871.

no history of syphilis, for its mother did not accompany the child at the three visits which it paid to the hospital. The further progress of this case consequently is not known.—B. H.

Diagnosis.—The affection with which the enlargement of the fingers and metacarpal or metatarsal bones is most likely to be confounded is necrosis of strumous origin. The following points will assist in distinguishing the syphilitic dactylitis: in the osseous variety the bone is enlarged evenly on all sides, often assuming midway between the articulations an ovoid or even globular shape. The soft parts covering this expanded bone though tense and marked with sinuous veins, are not altered by inflammatory changes, until the enormous expansion of the bone exposes them to accidental injury; in which case they may inflame, thicken, and ulcerate. In that form where the soft parts are mainly involved, and the bone only to a slight extent, the enlargement is again indolent and painless, with little tendency to suppuration and abscess, though the shape is not ovoid or globular as when the bone is primarily affected. In both forms abscess may eventually attack the soft parts, but it is much less a necessary phenomenon of the affection than it is of strumous disease.

In strumous disease, on the contrary, symmetrical expansion is unusual. Commonly the swelling is greatest near one end of the bone, and a nodule or lump is produced at one side. This lump may enlarge, grow soft, and fluctuate. Soon adhesions between the integuments and the lump are formed, softening and ulceration follow, permitting the escape of cheesy pus and exposing bare bone at the bottom of the cavity.

The Joints.—The articulations may be affected during the period immediately preceding the outbreak of the general exanthem; during the first six or twelve months, or not until several years after infection. There are thus, *prodromal*, *secondary* and *tertiary* joint affections.

The prodromal forms appear as aching pain of rheumatoid character, affecting one or more of the joints, most commonly the larger ones. That is to say, the pains are worst at night or before rising from bed in the morning, but pass away or are less severe after exercise. They are accompanied by no effusion and rarely by tenderness on pressure, though in some patients pain is easily produced by passive motion of the affected joint. Usually slight, they are occasionally intolerable. In most cases they precede the outbreak of the first exanthem and depart when that is fully out, though they may continue for an indefinite time before they cease spontaneously. Their seat may be in any or even all of the joints successively; but they select most frequently the shoulders and the knees, less often

the elbows, wrists and ankles. Vaffier[1] collected, during a cruise in a French man-of-war in Chinese and Japanese waters, a remarkable series of cases where these rheumatoid pains were very severe and precocious. In one seaman they commenced thirty days after contagion and fifteen days after the appearance of the chancre, and lasted for sixteen months with occasional remissions before they finally disappeared. During the cruise of more than two years, six of the crew of 400 men were infected with syphilis, and five of the six suffered from a prolonged course of these rheumatoid pains, attacking not exclusively the joints but also the muscles and periosteum. They are common affections of syphilis. Voisin[2] noted during the year of his office as *interne* of the Midi hospital at Paris, that one in fifteen of the patients treated that year for syphilis suffered from prodromal pains. These prodromal pains subside and leave no permanent ill effects. It has been remarked, however, that they have been exceptionally obstinate or severe in patients who have suffered from inflammatory affections of the joints or tendinous sheaths at a later period.

In the secondary stage, affections of the articulations are much more rare than prodromal pains, but still they undoubtedly do occur. Indeed, Brodie[3] remarks that chronic inflammation of the synovial membrane of one or more joints is not uncommon in connection with the papular eruptions of early syphilis. In one form, the joint is painful while at rest, especially at night; but movement increases the pain, though not to a high degree, and it may not exceed a sense of tightness in the joint. The swelling at the most does not exceed slight puffiness or doughiness of the coverings of the joint, and may be inappreciable. There may be,[4] though this is rare, redness or heat of the skin, but there is no pyrexia, or next to none. This affection has been seen in the knee, ankle, and wrist. The second form consists of a simple hydrothrosis, the knee-joint being its almost exclusive seat. The pain is less than in the preceding variety. Neither form persists long, though relapses are so common as to be characteristic. Still more distinctive of this synovitis from that produced by other causes is its speedy dissipation by anti-syphilitic remedies, two or three weeks or even a single week of mercurial treatment being sometimes sufficient for its removal. In a case recorded by Vinay[5] the patient had effusion into the right knee simultaneously with his first general eruption,

[1] Vaffier : Du Rhumatisme Syphilitique. Paris, 1875, p. 48.
[2] Voisin : Contribution à l'Etude des Arthropathies Syphilitiques. 1875.
[3] Brodie : Hawkins' edition of his works. 1865, vol. ii. p. 134.
[4] Lancereaux : Des Arthrites syphilitiques. L'Union Médicale. 1873, No. 88.
[5] Vinay : Annales de Dermat. et de Syphiligraphie. 1879, Nos. 5 et 6, p. 435.

which was cleared away completely in twelve days by mercuric inunction and potassic iodide internally. But interruption of treatment was followed by a fresh swelling in the knee and in one ankle. These second effusions were dispersed as speedily as the first by the same means.

The following cases have been lately under my care :—

Case 1. J. H., aged 21, seven months after infection complained of occasional slight pain in the right knee, which caused him to limp a little. He had been under treatment shortly before for a papulo-scaly syphilide and mucous patches and ulcers of the tongue and fauces. There was no urethral discharge, nor any history of rheumatism, injury, or the previous joint affection. Examination showed a moderate amount of effusion in the right knee joint, and a slightly tender spot over the inner side of the head of the tibia. The skin was not reddened, and there was no tenderness on pressure except at the spot just mentioned. Under mercury and iodide of potassium, with occasional blisters, the joint became normal in every way at the end of seven weeks, although the patient walked about as usual.

Case 2. H. T., aged 20, fifteen months after infection had slight aching in the left knee which was only troublesome after walking. The only other sign of syphilis remaining at this time was enlargement of the posterior cervical glands. As in the previous case, there had been no injury, nor any other ascertainable cause for the joint affection. On examination a rather copious effusion into the knee joint was found to be present. Under antisyphilitic treatment the fluid disappeared in ten days, but eleven days later it reappeared. Eleven weeks from the beginning of the effusion the joint had regained its natural state, and there was no return of the affection. Several small blisters were applied from time to time. The joint was not rested during treatment.—A. C.

Diagnosis.—The diagnosis of these early affections of the joints is usually not difficult. The presence of other signs of syphilis; the almost complete absence of general constitutional disturbance; the small amount of pain; and the absence of urethritis, or any previous injury to account for it, suffice to distinguish them from the rheumatic or other forms of arthritis.

The late or tertiary affections.—Synovitis similar to that which appears during the early period is sometimes developed five or more years after infection.[1] It is, however, more commonly associated with the gummy form.

The gummy form is always insidious, and is reserved for late periods of the disease. The parts interested are the aponeuroses, ligaments, contiguous tendons, their sheaths and bursæ, the subcutaneous cellular tissue, and lastly the skin. The bones and cartilages of the joints are less markedly affected than the soft parts surrounding them; but they become enlarged by slow periosteal and medullary thickening and by fibroid degeneration. The new growth invades the soft parts unequally. While rendering them all much

[1] Verneuil : Gazette Hebd. 1873, Janvier 10.

thicker than natural, flattish nodules also form. These gummata may soften and break by ulceration through the skin; or, undergoing contraction and induration, may remain as permanent tough masses of well-organised fibrous tissue. The gummata may ulcerate through the capsule into the cavity of the joint. Coulson[1] has recorded an instance of this termination, which, nevertheless, is a rare one. Where the thickening of the soft parts has gained a certain development, there is not infrequently more or less effusion into the synovial cavity, causing distension of the capsule, and thus forming one variety of chronic synovitis. Follin[2] was one of the earliest to recognise this affection of syphilis, and Lancereaux[3] first recorded a post-mortem examination of tertiary joint-disease. In this case the synovial membrane of the knee-joint was thickened and carpeted with layers of membranous deposit. The articular surface of the external condyle of the femur was eroded at one point. Secondary erosion affected the cartilages of the patella also. The semilunar cartilages and crucial ligaments were healthy. The ligamentum patellæ, the aponeurosis of the vasti muscles, and all the fibrous attachments to the tibia were converted into an uniform yellowish-grey elastic mass one inch and a half thick. In the middle a simple riband of fibres was all that was left of the ligamentum patellæ, while several bundles of fibres divided the gummy mass into segments. Under the microscope this new growth was found to have a structure identical with the gummy growths of the liver in the same patient. Verneuil[4] has recorded a case where, besides copious effusion, a gummy mass formed on the outer side of the joint, which subsequently broke down into a deep sore. Mollière[5] records a case where both elbows were attacked by gummy thickening of the soft parts, the left being most severely affected. To the foregoing may be added the following example.

A girl, of about twenty, who had been infected several years, and had suffered from several forms of skin eruption, and tertiary ulceration of the palate, applied for relief for painful swelling of the right ankle, which had been in existence for almost two years, and had at last prevented her from pursuing any occupation. The girl was pale and much wasted. The dorsum of the right foot and the ankle were swollen, so that the malleoli and tendons of the foot were no longer prominent or easily distinguished. This swelling extended to the heel and forwards nearly to the roots of the toes. The skin was dull crimson, brawny, and not ulcerated at any point: the swelling over the capsule of the ankle was almost fluctuating. Here and there among the brawny tissue were hard nodules firmly imbedded and adherent to the deeper structures. Movement of the ankle and

[1] William Coulson: Lancet, vol. i. 1858.
[2] Follin: Traité élémentaire de pathologie externe. 1861, tom. i. p. 714.
[3] Lancereaux: Traité de la Syphilis. 1873, p. 206, obs. xxii.
[4] Verneuil: Loc. cit.
[5] Mollière: Lyon Médical. 1879, Dec. 21.

extension of the toes were limited and painful. Pain also was produced by attempts at passive movements of the ankle and tarsal bones. Standing on the right limb caused severe aching pain, and walking produced sharp cutting pain in the ankle joint. Pain was also severe at night, but never 'starting' or 'jumping' in character. There was some constitutional disturbance. Evening temperature, 101° F. or thereabouts. Rest in bed with good food and iodide of potassium, removed aching pain from the limb in one week, and in three weeks the patient was able to stand and walk without pain; the swelling and brawny condition of the soft parts was greatly diminished, leaving the harder indurations more defined. Continued treatment restored the foot to its natural shape, and free play of the tendons in their sheaths returned. The malleoli and the tarsal bones were then found to have their natural form. The hard indurations ultimately disappeared; in place of a large one below and a little in front of the external malleolus, a depression adherent to the bone and tendons was left.—B. H.

Symptoms.—The affection has usually made much progress before the patient's attention is drawn to the condition of his joint. Among the earliest symptoms is slight pain or sense of stiffness, worse at night. The parts round the joint swell slowly, and as they swell and thicken the movements of the limb become impeded. Usually, when the thickening of the soft parts is well developed, rapid distension of the capsule by serous effusion takes place. But the most characteristic signs are the brawny thickening of the soft parts, and the easily defined hard nodules that project on the internal surface of the capsule, and give the same sensation of slipping to and fro which is produced by loose cartilages. Not infrequently the neighbouring skin is also marked by the white depressed scars of former gummy ulcers of the skin.

Diagnosis.—The tertiary affections of the joints, when occurring in young persons, may be confounded with strumous disease. But the history of syphilis, and the presence of other syphilitic affections, aid the diagnosis. In syphilis the skin is often broken down into gummy ulcers that are very distinct from scrofulous abscesses. The absence of thickening of the bones or grating of their surfaces against each other are also useful distinctions of syphilitic from strumous disease. The swelling in scrofula is more rapid, more evenly puffy, and devoid of defined indurated masses.

In chronic rheumatism, ankylosis and dry grating of the articular surfaces with no nodular thickening of the soft parts are sufficient distinctions. In syphilis though the joint is fixed, contracted, or much limited in its movements, fibrous ankylosis is rare. In some cases of so-called syphilitic rheumatism the thermometer is of great assistance in forming a diagnosis; two cases reported to the Clinical Society by Duffin[1] illustrate this very clearly. In both instances

[1] Duffin: Clinical Trans. 1869, p. 81. See also a report of the Committee on Temperature in Syphilis. Ibid. 1870, p. 170.

the evening temperature ranged between two, three, four, and even five degrees above the morning temperature. In both, the normal standard was quickly reached under the administration of anti-syphilitic remedies.

The prognosis is good if the nature of the affection be recognised. Joints that have been stiff, contracted, or limited in movement for years, with extensive ulceration of the integuments, quickly recover an almost healthy condition. If untreated, in course of time destructive ulceration may so clear away the ligaments and tendinous attachments and alter the bones, that the best recovery possible is accompanied by permanent deformity and rigidity.

SYPHILIS.

CHAPTER XIII.

THE MUSCULAR SYSTEM.

Muscular pains are very common during the first few months after infection and usually precede the appearance of the early cutaneous eruption. The pain is dull and heavy when the muscle is at rest; but may become acute during contraction; it may be limited to a part of a muscle which is also sometimes tender on pressure. The pain is often worse at night or on waking in the morning; it is usually moderate in degree, but occasionally so severe as to prevent sleep altogether. The thighs, calves, and loins are the parts most frequently affected, but the muscles of the shoulders and those about the back of the neck not infrequently suffer also. In a few days or weeks the pain subsides spontaneously, but relapses are not uncommon. It is readily amenable to anti-syphilitic remedies.

Debility and Wasting of the muscular system are also not rare. Fournier[1] states that two-thirds of his female patients suffer from muscular debility. The two affections may occur together, but weakness is sometimes considerable without any decided loss of bulk in the muscles. The loss of power is only temporary as a rule, but certain patients seem to suffer permanently. The wasting is similar to that observed in other chronic diseases, but occasionally takes place rapidly. It is always accompanied by wasting of the fatty tissue of the body. The patient generally soon regains his strength under specific treatment.

Tremor.—Fournier[2] describes as a rare phenomenon of early syphilis, a peculiar kind of tremor, affecting chiefly the muscles of the forearms. It is, according to the same author, in no way connected with the tertiary affections of the brain or spinal cord. The

[1] Fournier: Syphilis chez la Femme, p. 728.
[2] Fournier: Loc. cit. p. 733.

tremor always begins in the upper and rarely extends to the lower extremities; the muscles of the head and trunk are never attacked. The subjects of tremor are nearly always women. Fournier has only known one male to be thus affected. An attack comes on suddenly, and continues for a few hours, rarely a whole day. It always ceases during sleep. The liability to the tremor usually lasts a few weeks and then disappears; often however relapsing once or twice before it finally departs. Fournier has known its duration to be thus prolonged for five months. The tremor consists of a succession of rapid jerks that may render the patient incapable of sewing or writing while there may be much difficulty even in carrying food to the mouth. This affection, appearing so exclusively in women, is probably rather a form of hysteria than a true syphilitic symptom. No such cases have come under our own observation.

Muscular contraction.—This affection, distinct from the permanent contraction which may be produced by interstitial sclerosis of the muscle, has been traced as a rare phenomenon in the early period of syphilis by Notta[1] who drew the distinctions clearly between simple muscular contraction and interstitial myositis in cases observed by him in Nélaton's wards. Fournier,[2] Mauriac,[3] and others have also described it as a distinct condition. Van Harlingen[4] has lately published three cases of muscular contraction with a short summary of what is known concerning the affection. Some authors, on the other hand, include it in their description of the tertiary form of muscular syphilis.

This is a rare affection and usually appears about the sixth or seventh month, but Mauriac, who collected eleven cases and was able to fix the date after infection in eight, noted one in the third month of the disease. On the other hand, it may be postponed until a year has elapsed. The latest yet recorded appeared in the fifteenth month after infection. Consequently this is essentially an early phenomenon of syphilis. In some of the cases the accompanying affections were of severe character, such as serpiginous ulcers of the skin, periostitis and others usually reserved for a later stage. But in the larger proportion of the cases the accompanying symptoms were slight and such as are usual during the first six months of syphilis. It is important to note that the rheumatic diathesis has no influence in causing this affection. Mauriac has never observed it in rheumatic persons. Neither age nor sex nor occupation appears to have any predisposing influence.

[1] Notta : Archives Générales de Méd. 1850, vol. xxiv. p. 413.
[2] Fournier : La Syphilis chez la Femme. 1873, p. 722.
[3] Mauriac : Les Myopathies Syphilitiques. 1878.
[4] Van Harlingen : Amer. Jour. Med. Sci. 1880, April, p. 399.

The affection is nearly always limited to one biceps brachii and that most commonly the left; but Notta has seen it affect also the supinator longus, the flexors of the fingers and of the knee. Mauriac has in some of his cases noted the rigidity to attack the triceps as well as the biceps brachii. We have seen several cases of muscular contraction; in all, it was limited to one biceps brachii.

Symptoms.—The first symptom is gradual flexure of the forearm to a varying amount. Extension is always painful and limited to a certain point, beyond which the limb is immovable. Next in importance is pain; this consists in stiffness at the bend of the elbow increasing to severe pain if attempts are made to extend the forearm. There is also in some cases pain at night independent of motion, while pain is also felt when the tendon of the biceps is pressed. The tendon itself is clearly defined as a hard even cord without any swelling of the parts forming the elbow-joint. The fleshy belly of the muscle is usually not affected by kneading or pressure, though in rare cases the muscle is itself more sensitive than usual.

This affection is distinguished from gumma by the complete absence of any abnormal swelling; and by the early period of the disease at which it appears. From any articular or osseous affection it is distinguished by the freedom from swelling or tenderness of the structures entering into the joint. Left to itself, the contraction may last an indefinite time, but specific treatment removes it completely. Under any circumstances it often endures several months. Notta saw one case where the affection had lasted three and a half years.

The late affections of the Muscles comprise the diffused infiltration and the circumscribed gumma. Both forms are simply varieties of the same morbid process, and the gumma is rarely present alone. Usually appearing five or six years after infection, they are nevertheless sometimes precocious. Mauriac[1] relates a case in which the diffused form developed in the flexor muscles of the forearm of a girl of twenty, in the tenth month of her syphilis. The same author quotes two cases of gummata appearing five months, and one two months, after the appearance of the primary lesion.

The diffused form (myositis) consists in ill-defined swelling which is tender on pressure. There is usually but slight tension of the integuments, no doughiness, or adhesions of the skin to the swollen muscle. The swelling is hard, not fluctuating, and there is aching pain. The muscle is more or less fixed and its extension is painful if not impossible. Zeissl[2] was able to restore to almost its normal position the right leg of a woman which had been for two years

[1] Mauriac: Myopathies Syphilitiques, p. 109.
[2] Zeissl: Lehrbuch. 1872, p. 250.

drawn nearly to a right angle with the thigh, by mercury and iodide of potassium. Mauriac says that when it appears early it may disappear spontaneously, leaving the muscle but little affected in its function. Usually however, unless treated, the new connective tissue developed between the muscular fibres becomes fibrous and contracts into permanent cicatricial tissue. The muscular fibrillæ themselves degenerate, lose their striation, and fill with oil globules. Lastly, caseation or calcification may be the final change of the new growth and of the muscular fibres themselves.

In its early stages myositis is curable by specific remedies; but when elaborated into fibrous tissue is little affected by treatment. The fascial envelopes may also be affected; Ricord has seen adhesions between the fasciæ and the muscles.

Any muscles of the body may be the seat of the infiltration, but those of the limbs are most frequently attacked. Lancereaux[1] thinks that the muscles of the lower extremities, especially the gluteus maximus, are the favourite seat. Duplay[2] reports a case of myositis of the pectoral, and more recently one of the sartorius; Guibout[3] and others of the biceps; Callender[4] of the deeper part of the deltoid. In young children the commonest seat of this affection is the sternal part of the sterno-mastoid muscle.[5] We have seen a marked example of this induration in a child of three years old who had inherited syphilis. The muscles of the orbit also have been reported by Bouisson to be affected. Mauriac[6] quotes three cases from Guyot where the masseter was affected, causing more or less locking of the jaws. Gafé[7] describes a patch of syphilitic infiltration of the upper part of the rectus abdominis, and Le Dentu[8] one of the outer head of the gastrocnemius.

Circumscribed gummata are rare forms of late syphilis. They occur in inherited as well as in the acquired disease. They are met with as oval tumours, usually adhering closely to the muscular fibres, and have been found in most of the muscles of the body. In a case reported by Sydney Jones,[9] they lay between the muscular fibres of the triceps brachii. Bouisson[10] has seen them in the sterno-mastoid, vastus externus, and the laryngeal muscles, and Murchison[11] in the

[1] Lancereaux : Traité de la Syphilis, p. 214.
[2] Duplay : Archiv. Gén. de Méd. 1879, p. 731. Also Idem. 1880, Aug. p. 218.
[3] Guibout : L'Union Médicale. 1879, p. 2.
[4] Callender : St. Barth. Hosp. 1873.
[5] Furneaux Jordan : On Surgical Inflammation. 1870.
[6] Mauriac : Loc. cit. p. 116. See also Blavette : Thèse sur le resserrement des Mâchoires. 1860.
[7] Gafé : Journal de Méd. de L'Ouest. 1872, June 1.
[8] Le Dentu : Gazette des Hôpitaux. 1875, May 13.
[9] Sydney Jones : Path. Trans. 1860, vol. xi. p. 246.
[10] Bouisson : Gazette Médicale, pp. 543, 563. 1846.
[11] Murchison : Path. Trans. 1862, p. 250.

diaphragm. The muscles of the upper extremity are more often attacked than any others except those of the tongue. The gummata accommodate themselves to some extent to the contour of the muscle, and form very frequently at or near its attachment to the bone. Their size varies from that of a pea to that of a pigeon's egg. They are rarely single, but are usually scattered in numbers through a single muscle, or one group of muscles, and they are generally observed with syphilitic disease in other tissues also; for instance, in the bones, dura mater or viscera. On section, they are seen to be clearly circumscribed, greyish-red, yellowish-white, or dense white in colour; usually firm, sometimes gelatinous, homogeneous or fibrillated, at other times with yellow cheesy masses scattered through their substance.[1] Their histological structure consists in masses of round, nucleated granulation cells, springing from the cellular tissue between the fasciculi. These cells rapidly degenerate into a structureless mass of granules and fatty molecules held together by a vascular stroma of connective tissue which separates them from the proper muscular tissue.

The Symptoms caused by gumma are not very distinct. Pain is not always present, but when so, it is usually increased at night, or by contracting the muscle. The tumours are fixed[2] when the muscle is contracted, and movable when it is relaxed. If left to themselves, they slowly enlarge, or soften at the centre, and by ulceration and absorption may communicate with the surface, forming a ragged suppurating cavity. If treated, they commonly disappear in a short time.

Diagnosis.—The diagnosis depends mainly on the previous history or coexistence of other symptoms of syphilis. When these are wanting or imperfect, the diagnosis often cannot be established until the effect of treatment has been ascertained.

The Prognosis is good if the nature of the affection be recognised before fibrous contractile tissue has formed, as the new growth before that stage can be readily removed by treatment. If contracture have already taken place, the muscle is permanently disabled; nevertheless, this result is sometimes long delayed, as the infiltration or circumscribed swelling may exist for years (three years, Guyot), and yet be wholly absorbed under anti-syphilitic treatment.

Atrophy of certain muscles through a gummy tumour pressing on their nerves and thus cutting off their nervous influence, has been observed a few times. Baréty[3] described two cases of atrophy of

[1] Wagner: Archiv der Heilkunde. Bd. vii., S. 525.
[2] Nélaton: Gazette des Hôpitaux. 1861.
[3] Baréty: Annales de Dermatologie et de Syph. 1873-4, pp. 206, 276.

the interossei of the hand, which was, in his opinion, due to compression of the ulnar nerve by gummatous tumours. Wilks and Moxon[1] also mention cases of wasting of muscles which, at first supposed to be due to progressive muscular atrophy, rapidly recovered under iodide of potassium.

Tendons.—During the early period of syphilis the sheaths of certain tendons have been described by Verneuil[2] and Fournier[3] to be occasionally charged with serous fluid. This is an extremely rare affection, and hitherto has been observed mainly in the extensors of the fingers, and in one or two instances in the sheaths of the extensors on the back of the foot. In most of Verneuil's cases both wrists were affected. A somewhat flattened triangular tumour with the base towards the fingers is produced. The swelling exactly occupies the position of the serous sac of the sheath of the extensors. It is formed suddenly, fluctuates, but is neither painful nor tender, and there is no reddening of the skin. In some cases, effusion into the synovial sacs of the larger articulations appears at the same time. The movements of the tendons are only slightly, sometimes not at all affected. The swelling rapidly disappears under anti-syphilitic treatment.

The diagnosis of the syphilitic nature of these swellings depends on the absence of signs of rheumatic or gouty diathesis, the presence of general syphilis elsewhere, and the ease with which they are dispersed by mercury or iodide of potassium.

Inflammatory swelling of the tendons during early syphilis is a different affection from the preceding.

In an example which came under my observation, the patient was a young man, about twenty-three years of age. Infection had occurred four months previously, and the trunk and limbs were nearly covered by roseola; the indurated scar of the initial lesion and the enlarged inguinal glands still remained. While the roseola was at its height, a painful swelling appeared behind the external malleolus of the left ankle, increased by walking or even standing. The aching pain was also worse at night. The swelling was about two inches in length, tender and elastic, reaching round the back and under the tip of the malleolus, along the peronei tendons; the skin over it was tense and pink. Movements of the ankle-joint caused sharp pain, especially movements of flexion or eversion. There was no general swelling of the ankle-joint. The patient, a clerk, was unwilling to lie up, and continued his occupation, sitting or standing several hours daily. Mercury was prescribed internally, and warm bathing for the ankle at night. As soon as the gums showed the mercurial influence, the pain departed and the swelling gradually diminished, lasting altogether about five weeks. It left no stiffness or thickening.—B. H.

[1] Wilks and Moxon: Path. Anat. 1875, p. 94.

[2] Verneuil: De l'hydropisie des gaines tendineuses des extenseurs des doigts dans la Syphilis secondaire. Gazette Hebd. 1868, Sept. 25, p. 609.

[3] Fournier: Sur les lésions des gaines tendineuses dans la Syph. secondaire. Gaz. Hebd. 1868, Oct. 9, p. 645. And Syphilis chez la Femme. 1873, p. 703.

Fournier,[1] who has described cases of this affection, considers them to be due to synovitis of the tendon's sheath; and he has observed it most frequently in the extensors of the toes; but he has seen it also in the tendon of the biceps and of the extensors of the fingers. On the front of the ankle the swelling is divided by the annular ligament, and appears as a double swelling above and below it. In Fournier's cases, and in one recorded by Mauriac[2] where the sheath of the extensors of the fingers were attacked, the pain radiated up the limb, and was accompanied by pyrexia and considerable pain. There was also effusion into the knee-joint and around the tendon of the biceps at the elbow. The former author points out that in cases where swelling is ill-marked and pain the leading symptom, this affection is frequently mistaken for rheumatism. The limitation of the pain to a precise spot, exactly in the course of a tendon, increased by pressure and by every movement of the limb which causes strain or tightening of the tendon, are the points which serve to distinguish it from arthritis.

The late affections of tendons.—These are identical with those of the muscles, with which they are always more or less connected. They appear commonly five or six years after contagion, though exceptionally they may accompany the general eruptions in early syphilis. On the other hand, they may be postponed for an indefinite number of years. Besides the long tendons, the aponeuroses of the muscles may be affected. The parts most commonly attacked are the aponeuroses of the vasti, the fascia lata of the thigh near the knee, the tendo Achillis and the tendons of the flexors of the fingers. Bouisson[3] and others record instances of both tendines Achillis being attacked in the same patient. In Lancereaux's case, noticed in the preceding chapter, the left ligamentum patellæ and the fibrous aponeuroses attached to the kneecap were converted into a uniform greyish-yellow elastic mass, one inch and a half thick. When assuming the nodular form, the gumma is most frequently developed on the surface of the tendon, in masses of varying size. While it is small though closely adherent to the tendon, the mass is easily defined, but the larger ones gradually merge into the substance of the tendon so that their size and contour cannot be exactly made out.

These affections are usually painless; though when situated near joints, they may cause stiffness or pain by interfering with the movements of the joint. Serous effusion into the synovial capsule may

[1] Fournier: Syphilis chez la Femme. 1873, p. 707.
[2] Mauriac: Des synovites tendineuses. Gazette des Hôpitaux. 1875, pp. 274, 297. Also translated by Francis Cadell: Edin. Med. Journal. Sept. and Nov. 1875.
[3] Bouisson: Gazette Médicale de Paris. 1846, pp. 543—563.

also occur. In course of time the swellings if untreated, soften, liquify, cause ulceration of the integuments and break into hollow ragged sores; but under appropriate anti-syphilitic remedies they usually subside.

The Bursæ.—Verneuil[1] and Fournier[2] have recorded observations of fluid distension of the bursæ over the olecranon and patella, during the period of early general eruptions. Such effusions appear to be identical with those into sheaths of tendons and into joint cavities, which are also occasional accompaniments of early syphilis.

Late affections of bursæ have been occasionally recorded as an accompaniment of tertiary syphilis in other organs. They have been described by Verneuil and by Keyes;[3] the latter author has collected twelve cases, of which seven had not been previously published. Of the twelve cases, six were in males and six in females. The most frequent period for their appearance was five years after infection, though it ranged between one and a half and eight and a half years. In the two cases observed by ourselves, the periods were eight years and probably twelve years respectively after infection. The bursa most commonly attacked is that in front of the patella. Probably this is owing to the liability of this bursa to injury, a traumatic exciting cause having been traced in half of the cases collected by Keyes. The bursæ may be affected either primarily or by extension of gummy infiltration from the skin or other neighbouring structures. When the affection begins in the bursa its walls become much thickened, and its cavity much contracted by the gelatinous new formation. When degeneration has proceeded to softening, the integuments inflame and ulcerate, exposing the gummy growth, which rapidly breaks down into a ragged cavity. Cicatrisation is slowly reached with a depressed scar closely adherent to the subjacent parts.

When the gummy tissue implicates the bursa by extension from the skin and subcutaneous cellular tissue or from a tendon or muscular aponeurosis, the process is very similar, but the bursa in this case does not form a distinct circumscribed tumour, the thickening of its walls being blended with that of the surrounding parts. In either form the affection is an insidious one, causing no pain until inflammation and ulceration take place.

Two examples of tertiary bursitis may be recorded here. 1. A man of thirty-three, with syphilis of eight years' duration, had tertiary disease of the fauces and

[1] Verneuil; Gazette Hebd. 1873, Janvier 10.
[2] Fournier: Syphilis chez la Femme. 1873, p. 706. See also Allen Sturge: Brit. Med. Journal. March 13, 1880.
[3] Keyes: Syphilis as affecting Bursæ. Amer. Journ. of Medical Sciences. 1876, April.

pharynx, and nodes on the left parietal bone, sternum, and left tibia. During a period of intermission of treatment, the bursa over the right olecranon enlarged without pain or attracting the patient's attention until it had reached the size of a small walnut, when he came to the hospital for treatment. On examination, there was found a painless, circumscribed, slightly fluctuating swelling over the right olecranon, with the skin movable over it, though the mass itself was attached to the parts beneath. The bone and other constituents of the elbow-joint were quite unaltered. The swelling continued several months, getting firm and somewhat irregular before it began to lessen in bulk. Under continuous treatment the mass slowly and completely disappeared, leaving no scar nor adhesion of the skin.

In the second patient, a woman of fifty, the length of the infection could not be ascertained. Nor was there copious history of previous syphilis. When she applied at the Lock Hospital for relief, the skin over the outer side of the left knee for two inches above the external condyle and about one inch below it was coppery red, thickened, uneven, and adherent to the aponeurosis beneath. The swelling extended forwards to the patella and the patellar ligament: in front of the patella was a swelling the size of a small egg projecting forwards in the thickened integuments. This was hard and fixed to the patella and to the surrounding parts. At the middle of this swelling the skin had already given way, exposing an uneven hollow, partially filled with glairy matter. The movements of the knee were painful, the easiest position being that of semiflexion. This condition was quickly relieved by iodide of potassium, and ultimately the skin regained nearly all its natural suppleness, but a tough depressed scar was left.—B. H.

SYPHILIS.

CHAPTER XIV.

INHERITED SYPHILIS.

THE descent of syphilis by inheritance was long declared to be impossible, and it was contended that syphilis in young children was merely a congeries of eruptions of a non-specific kind attacking children born of unhealthy parents, and thus inheriting a feeble constitution. The reality of the transmission of syphilis from mother to child is now established beyond dispute; but diversity of opinion still exists respecting the mode in which the disease passes from the father to his offspring. The reader is referred for the discussion of this question to the chapter on Contagion.

Syphilis is also frequently acquired by infants. In this mode of infection the initial lesion appears at the point of contagion, and the subsequent symptoms in many respects do not differ from those usual in adults; but, in addition, the child who has acquired his disease in early infancy may, during his subsequent childhood, suffer from the affections of various organs which have been recognised as characteristic of the disease when inherited. The explanation of this similarity between acquired and inherited syphilis in young children is that the poison is in both cases implanted in the patient when his tissues are growing rapidly, and consequently are similarly affected in their growth by the pervading influence of the disease.

In this chapter we shall therefore only describe the more special features of the disease as it shows itself in early life, the affections of the several organs due to inherited syphilis having been already to a great extent treated of in the preceding chapters.

In early infancy, besides the usual affections of the skin and mucous membranes, visceral lesions, though less common, are occasionally developed. But should the child survive the exhaustion attending the disease, these symptoms disappear in a few

months, and the disorder in most cases comes to an end. This does not always happen, for in later childhood or in adolescence, sequelæ of a tertiary character may appear, and attack any organ of the body, either by impeding the development of the organ or by producing special lesions in its substance.

Whether the late forms are always preceded by syphilitic manifestations in infancy, or whether they may constitute the first sign of inherited syphilis, is not yet decided. Hutchinson,[1] however, is satisfied that all infantile symptoms may be absent, and that growth and development may be perfect until puberty or even much later, when symptoms unquestionably due to inherited taint may show themselves for the first time. Laschkewitz,[2] in reporting four cases of tertiary disease due to inherited syphilis in which the patients' ages varied from thirteen to twenty-three years, discusses this question at considerable length. He does not, however, bring forward conclusive evidence in these cases to show that no symptoms had been present in infancy. For our own part we are inclined to agree with Weil, Oewre, Flindt and others, who maintain that infancy is never passed without some symptoms of the disease being present. However this may be, syphilis in children divides itself for the purposes of description into two forms, an early and a late one.

During intra-uterine life the influence of the disease acting upon the fœtus itself, or upon the uterus and the system of the mother, is a frequent cause of abortion or premature birth; in which case the fœtus itself frequently betrays the effects of the poison in its body. For example, in ninety-two examinations of macerated syphilitic fœtuses recorded by Mewis,[3] the spleen was diseased in seventy-two; the bones were affected by osteo-chondritis in sixty-four; the liver was diseased in fifty-six; the pancreas in fourteen; the supra-renal bodies in eleven; the lungs in three; and the skin in one. When born alive, the child may be marked with bullæ of pemphigus,[4] but it is often free from external marks of disease, and remains, to all appearance, well for the first few weeks, being often plump and well nourished during that time. The healthy aspect is, in most cases, soon lost; though some children, who are but slightly affected, retain a flourishing appearance throughout their disease. The child snuffles as with a cold, is fretful and wastes; by the end of three or four weeks he often loses the robust condition he possessed at birth. When the loss of flesh is considerable the child soon

[1] Hutchinson: Brit. and Foreign Med. Chir. Review. October, 1877, p. 476.
[2] Laschkewitz: Ueber S. hered tarda. Vierteljahr. f. Derm. ü. Syph. 1878, Bd. 5, S. 269.
[3] Mewis: Zeitsch. f. Geburtshülfe ü. Gynaekologie. 1879, p. 43.
[4] In 153 syphilitic fœtuses Mewis never found any skin affection earlier than the eighth month of intra-uterine life. Ibidem, p. 62.

looks like a little old man. His skin grows wrinkled and loose, and assumes a muddy or bistre hue. This colour is best marked on the forehead, chin, and other prominent parts. The skin, though loose, is very brittle, and breaks around the mouth, eyes, and nose into chaps that bleed easily; the cuticle peels from the fingers, hands, and feet, on which coppery patches can generally be found; the hair of the scalp, the eyebrows, and lashes drop, and the nails are small and ill-developed. The child's cry is especially worthy of mark: it is hoarse and snuffling, from the nostrils being stuffed with thick yellow mucus. The plugging of the nares hinders the child's sucking, by obliging him to keep his mouth open to breathe; thus the nasal catarrh seriously interferes with his chance of recovery. The inside of the mouth and the palate are beset with white patches and sores. Around the anus also there are coppery-red patches. In the course of a few weeks the wasting becomes extreme; the child is seized with vomiting and diarrhœa, bronchitis, pneumonia, or some other visceral disorder, by which his remaining strength is exhausted, and he dies. If the disease be left untreated, this termination is frequent, especially among the ill-fed children of the poor. Children with good nutrition, in whom the disease has been slow to develope, often recover in a short time, and suffer no further from its influence; but sometimes in later childhood they become again its prey. After death no one morbid change is constantly found; indeed, in many cases, no characteristic lesion at all is discovered. In a certain proportion of the patients the various changes that characterise syphilis are developed in the viscera. These lesions are most frequent in the bones. The liver, the lungs, the spleen, and other organs are also occasionally the seat of these morbid processes.

After this outline of syphilis in children, which in many cases includes nearly all the symptoms developed in the course of the disease, a more detailed description may be furnished.

The period at which syphilitic symptoms appear in the child, depends greatly on the length of time that has elapsed since the mother's infection. Women who are infected shortly before conception rarely complete their gestation. This part of the question has already been fully treated in the chapter on Contagion. When the child is born at full term signs of the disease appear most commonly from two to six weeks after birth. Diday[1] has collected 158 cases of syphilis in infants: 131 of these showed symptoms before the end of the second month; in 86, symptoms appeared before the thirtieth day. Several sickened earlier than this, and were covered with

[1] Diday: Infantile Syphilis, translated for the Sydenham Society, p. 109.

eruption a fortnight or three weeks after birth. In only twelve cases was the period of delay carried beyond three months. Roger[1] has added to the 158 cases of Diday, 14 of his own, 28 of De Méric's,[2] and 49 of Mayr's of Vienna, making altogether 249 cases, in seven-eighths of which the disease appeared before the end of the third month. In half, the symptoms appeared during the first four weeks after birth. In 124 cases observed by Kassowitz[3] the syphilitic symptoms appeared in all before the end of the third month, and in 53 per cent. during the first month. The same author has further remarked that the time of appearance of symptoms in successive children is postponed in proportion to the age of the mother's syphilis.

When the disease becomes active the appearance of symptoms is preceded by prodromata consisting of continuous crying, pyrexia, wasting, pallor, and restlessness; these are manifested even before the coryza, according to Kassowitz. Cuffer[4] has found the blood in syphilitic children very pale and fluid, and the proportion of the red corpuscles much diminished. Parrot remarks that with great pallor the child may be very fat.

To these preliminary symptoms is quickly added an eruption of the skin. The eruption assumes various forms which mostly resemble those of acquired syphilis.

Roseola is commonly an early sign of the disease. Bassereau[5] mentions an instance of its appearing three days after birth, and being followed the next day by snuffles. The spots are not long the sole symptoms in any case. Mucous patches in the mouth and excoriations of the nostrils very soon follow. The latter are, according to Zeissl,[6] never absent if the macular eruption be present.

Papules are sometimes present at birth, but not often. They are most commonly met with in groups on the buttocks, lower limbs, and genitals, appearing among the roseola which preceded them. On the scrotum the papules frequently coalesce into a general thickened red surface, which obliterates the rugæ and from which the cuticle peels in large flakes. Occasionally the papules increase to the size of a shilling or larger, and form an even surface considerably raised above the surrounding skin. This variety, not uncommon in infants, is also occasionally seen in adults. About the outlets of the body papules are very apt to be converted into mucous

[1] Roger: L'Union Médicale. Jan., 1865; and Lancereaux: Loc. cit., p. 538.
[2] De Méric: Lettsomian Lectures. 1858.
[3] Kassowitz: Loc. cit., section vii. Caspary has also collected a large number of observations bearing on this point. Berliner Klin. Wochenschrift. 29 März, 1875.
[4] Cuffer: Quoted by Parrot: Le Progrès Médical. No. 25, 1878.
[5] Bassereau: Loc. cit., p. 541.
[6] Zeissl: Lehrbuch der Syphilis. 1872, p. 307.

patches. In some cases the papules form all over the body, but the most common positions are the flexures of the joints, the palms and soles, and especially the heel. They do not differ in structure from the papular eruptions of acquired syphilis.

Mucous patches are invariably present in inherited syphilis, and often are very numerous. They appear in a few days after the roseola or other rash and recur from time to time during the whole period of eruption. They are met with at the corners of the mouth, in the nostrils, and often in the groins and axillæ, or between the toes; but they are most common round the anus, on the perinæum, and, if the child be a girl, at the vulva.

Ecthymatous Pustules are met with in very feeble children. Sometimes they are the first sign of the disease, sometimes they appear shortly before death. They never remain the sole or predominant sign, and have no distinctive character. The matter they contain dries in a few days into a thick crust, under which the skin sometimes ulcerates into sharply cut sores with plentiful discharge. More often, however, the pustules shrink and heal up without causing much irritation.

Barlow[1] has drawn attention to the occasional development of cutaneous abscesses which somewhat resemble boils, but have no core and contain laudable pus. F. Taylor[2] has observed two cases similar to the one described by Barlow.

Pemphigus in syphilis is almost entirely confined to children, and is only seen in those who suffer severely. Trousseau[3] has related that six children in one family were born dead of syphilitic parents, each child being marked with pemphigus. It is one of the earliest of all the eruptions, being in most cases present at birth. Indeed Parrot[4] has found it as early as the sixth month of intra-uterine life. The affection has a rapid development, and, when not present at birth, generally appears before the child is seven days old, though it may be delayed in rare instances until after the fifteenth day. The skin is beset with dark red patches, elevated sometimes into papules, and the cuticle over them is raised into transparent blebs between a pea and a thrush's egg in size. The fluid in them turns yellow, and the vesicles often merge into each other. In a few days they burst; their contents, mixed with blood, dry to greenish yellow scabs, under which the patch ulcerates. Around the bullæ the skin is also red and swollen, sometimes lighter, sometimes darker than the patches themselves. Fresh crops of bullæ often rise around the

[1] Barlow: Lancet. November 4, 1876.
[2] F. Taylor: Lancet. January 13, 1877.
[3] Trousseau: Union Médicale. 1857, p. 196.
[4] Parrot: Progrès Médical. 1878, p. 57.

old ones. The eruption always begins on the palms and soles, and may spread up the legs and thighs and, in very bad cases, even all over the body. The patients who have this form of eruption die usually in a few weeks from diarrhœa, bronchitis, or other intercurrent disease. Instances of the eruption subsiding are rare. Galligo[1] records a case of recovery through mercury.

The distinctions between syphilitic and non-syphilitic pemphigus are as follows:—the non-syphilitic form is never present at birth, nor until wasting has considerably exhausted the child; consequently he is several weeks old before the eruption appears. Syphilitic pemphigus always attacks the palms and soles,[2] rarely covers the trunk, and is accompanied by other symptoms of syphilis, if the child live long enough for their development. In the non-syphilitic form the palms and soles escape, and the eruption is scattered irregularly over the body.

Tubercular Syphilides are rare in inherited syphilis, but when they occur, they resemble in every way those of acquired syphilis. They are an affection of childhood rather than of infancy.

Subcutaneous Gummata are more frequent than the cutaneous tubercles. Though appearing occasionally in infants, they are not usually met with before the second or third year. Bouchut[3] reports a case of multiple gummata in a child six months old. The nodules eventually softened and formed numerous abscesses. Virchow[4] also has observed subcutaneous gummata in a new-born infant.

Hæmorrhagic spots with anasarca are occasionally observed in newly-born children whose viscera are affected by syphilitic changes. The skin is distended by serum, while its surface is dotted with small purple ecchymoses. The distention begins or is most marked around the navel, but it may travel over the whole of the body. This condition has only lately been attributed to syphilis, though Bärensprung and others have recorded the occurrence of purpura in newly-born syphilitic children. Schütz[5] has recorded the examination of a marked case of this kind in which the lumen of the arteries in several regions and organs was greatly contracted, partly by hypertrophy of the intima, but still more by great thickening of the adventitia due to hyperplasia of its external layers, and the formation of concentric rings of new cells. In and among this proliferated

[1] Galligo: Bulletin de la Société Anatomique, p. 372. 1851.

[2] An exception to this is recorded by Labat (Progrès Médical. 23 Oct., 1880). A syphilitic woman bore a female child, which at birth was covered with pemphigus, except on the palms and soles; in these situations the skin was red and shining, but free from bullæ. The child died in twelve hours. No visceral lesions were discovered post mortem.

[3] Bouchut: Gazette des Hôpitaux. 1876, Août 1.

[4] Virchow: Gesammelte Abhandlungen, p. 295.

[5] Emil Schütz: Zur Anatomie der Syph. der Neugebornen. Klebs: Beiträge zur Pathol. Anatomie. II. Heft, Prag. 1880, p. 93.

cellular structure were piles or groups of red blood-corpuscles forming distinctly red spots. Schütz, whose essay is a valuable contribution to the proper appreciation of this form of syphilis, also quotes Behrend[1] and other authors who have touched on the subject.

Alopecia is mentioned by Parrot[2] as being, when it occurs, nearly always limited to the posterior and lateral parts of the scalp. See also "Alopecia," p. 130.

The Nails are rarely affected in inherited syphilis. Lancereaux[3] has collected the observations of Bertin, Doublet, and one or two more, who have mentioned falling of the nail. But fall of the nail from perionyxis or inflammation of the matrix is not a specially syphilitic affection; it is more probably a consequence of extreme debility, for it may occur in exhausted children who have no other evidence of syphilitic disease. Hutchinson[4] has described the truly syphilitic affections of the nail minutely, and gives an excellent drawing of them in his paper on diseases of the nails in syphilis. He finds that the various layers of the nail split and grow jagged, from being badly developed in the matrix. Several nails, some on each hand, are always attacked, and the malformation is very obstinate and long continued.

The Lymphatic glands.—These are affected in inherited syphilis, though not commonly. They enlarge, become hard and tender but rarely suppurate, though in older children the subcutaneous tissue and skin about them sometimes soften and break down into ragged intractable ulcers which are not infrequently mistaken for strumous disease. The glands of the neck and of the groin are those most commonly attacked, but those of the armpit and of other regions also occasionally increase in size. Woodman[5] found enlargement of some group of glands in sixteen per cent. of his cases.

The Mouth and Throat.—Around the mouth, the skin and mucous membrane frequently present numerous radiating fissures. These fissures are most common on the upper lip to the right and left of the middle line, but fissures and mucous patches may involve the whole of the inner surface of the lips. Somewhat deep ulceration may also occur in this region, leaving scars which in later life are often a valuable sign of the inherited disease.

On the mucous membrane of the inside of the mouth, the tongue, and the throat, shallow ulcers are common, but they often escape

[1] Behrend: Ueber Syphilis hæmorrhagica. Deutsche Zeitschrift f. prakt. Med., 25 u. 26.
[2] Parrot: Progrès Médical. 1878, No. 22.
[3] Lancereaux: Traité de la Syphilis. 1873, p. 417.
[4] Hutchinson: Path. Trans., vol. xii., p. 259.
[5] Woodman: On Congenital Lues. Trans. St. Andrew's Medical Graduates' Assoc. 1874, p. 14.

notice on account of the difficulty in making a thorough examination of these parts in young children.

Gummata also occur in the tongue, velum, hard palate and pharynx. They are rare before the fifth or sixth year of life and are commonly delayed until the tenth or twelfth. Drysdale[1] observed a gumma of the tongue in a girl aged 16. These gummata often break down and give rise to obstinate ulcers which spread extensively and cause, in many cases, much difficulty in the diagnosis of the true nature of the disease.

With regard to the *visceral affections* in inherited syphilis, Mewis[2] records that in his examination of 141 syphilitic fœtuses, he never found the lungs affected before the sixth month; nor the pancreas before the eighth month; the liver, spleen and bones, with about equal frequency, were found affected as early as the fifth month, and the older the fœtus, the more extensive were the lesions.

In the Stomach and Intestines small ulcers of the mucous membrane have been recorded in post mortem examinations of debilitated syphilitic infants; but they do not differ from ulcers found in children whose exhaustion has no connection with syphilis.

The Peritoneum is occasionally thickened and adherent in cases of disease of the abdominal viscera. Sir James Simpson[3] published two cases of peritonitis in children whose mothers were syphilitic. Bärensprung[4] also describes peritoneal thickening and adhesions to the viscera. In the case of a syphilitic child, aged three months, Cheadle[5] found the gall bladder, cystic, hepatic, and pancreatic ducts matted to each other and to the duodenum and transverse colon by old adhesions.

The Liver.—The affections of the liver in inherited syphilis are in most respects similar to those determined by the acquired form of disease. The organ may become affected in infancy, childhood, or adolescence, and even during intra-uterine life. Küstner[6] reports two cases of children born at the eighth month with cirrhosis of the liver and ascites. According to Parrot[7] the liver is most frequently found diseased in children who die about six weeks after birth. The oldest child examined by Parrot, where disease of the liver was discovered, died when it was twenty-two months old. Rindfleisch has met with scars of old liver disease in post-mortem examinations of children from ten to fifteen years of age.

[1] Drysdale: Med. Press and Circular. 1875, May 19.
[2] Mewis: Loc. cit., p. 62.
[3] Simpson: Obstetrical Works, vol. ii., pp. 157, 162.
[4] v. Bärensprung: Die Hereditäre Syphilis. 1864.
[5] Cheadle: Brit. Med. Journal. 1875, vol. i., p. 669.
[6] Küstner: Archiv für Gynaekologie. 1876, p. 134.
[7] Parrot: Progrès Médical. 1879.

Tepel[1] compared the relation of the weight of the liver in fourteen syphilitic new-born children and in fourteen non-syphilitic children, to that of the total weight of the body. He found that, whereas in the fourteen non-syphilitic children the ratio of the liver's weight was one twenty-fifth, in the syphilitic children it was one thirteenth, or about double its normal proportion. For further details of the affections of the liver in inherited syphilis, see Chapter V.

The Spleen, Pancreas, and Supra-renal bodies.—The affections of these organs in inherited syphilis have also been described in Chapter V.

The Thymus.—The state of the Thymus attracted the attention of Dubois[2] in 1850. He observed in syphilitic children a condition of the thymus that has since been described by Depaul,[3] Wedl[4] and others; though it is not yet clear how far syphilis is concerned in its production. Collections of matter, which may be as fluid as pus, or semi-solid, are scattered through the interior of the organ.[5] Hence, possibly a process of a gummy kind produces these dense opaque yellow collections. The true nature of the affection is still uncertain: Parrot[6] maintains that the condition described by Dubois is not essentially syphilitic, but is caused by the state of mal-nutrition common to syphilis and other wasting diseases. He observes that nothing is yet known of the truly syphilitic affections of the thymus. In most cases of inherited syphilis no alteration of any kind is found in this organ.

The Nose.—Coryza is a very early and very constant symptom of inherited syphilis; Woodman[7] found it present as 'snuffles' in 108 out of 200 children whose clinical histories he analysed for comparison. It sometimes exists in a mild form without attracting observation, being mistaken for simple catarrh. The mucous membrane of the nose may become swollen very early, and its discharge, thin at first, grows yellow and so thick that it blocks the nasal passages and forms thick crusts about the nostrils where mucous patches also form. These chap and sometimes ulcerate deeply. But usually the child, being compelled to open his mouth to breathe, can suck only very imperfectly. The coryza thus greatly interferes with his feeding and becomes a most serious complication. In very feeble children this chronic inflammation of the mucous membrane

[1] Tepel: Beiträge zur pathologischen anatomie der congenitalen Syphilis. Berlin, 1874.
[2] Dubois: Gaz. Méd. de Paris. 1850 and 1851.
[3] Depaul: Mémoires de l'Académie de Médecine, t. xvii., p. 563. 1853.
[4] Wedl: Path. Histologie.
[5] Hecker (Monatschrift für Geburtskunde. 1869, S. 22) found induration, enlargement, and abscess in the thymus of several children.
[6] Parrot: Progrès Médical. 1878, p. 655.
[7] Woodman: Loc. Cit.

may extend to the perichondrium and periosteum, and destroy the cartilages and bones of the nose; the bridge then flattens, the discharge becomes fœtid, and fragments now and then break away from the vomer and spongy bones.

The affections of the **Larynx, Trachea**, and **Bronchi** have already been noticed. See Chapter VI.

The Lungs.—The affections of the lungs produced by inherited syphilis are hardly ever seen except in dead-born or very young infants. They were first described by Depaul,[1] and afterwards by Virchow[2] and others.[3]

This affection has two forms, the nodular and the diffused. *In the nodular* the lung or part of it is beset with little firm nodosities, isolated or grouped, of grey or red colour, in size ranging between a lentil and a small nut. They are spheroidal or lobulated in shape and are beset throughout with little whitish or yellowish points. These nodules are placed both superficially and deeply, and form a peculiar kind of lobular hepatisation.

In the diffused form part of a lobe or a whole lower lobe of the lung is rendered dense and heavy, so that parts cut off sink at once in water. The pleura over them is always inflamed, thickened, even adherent, and the affected portions are smooth and greyish-white on section. This limited hepatisation was termed by Virchow, *pneumonia alba*.

The minute structure of the isolated nodules, and of the infiltrated parts is the same. The walls of the alveoli, the peri-bronchial and peri-vascular tissue are thickened by new cells, mainly of round or fusiform embryonic character. The alveoli themselves are filled with layers of pavement cells. In the midst of the alveoli are round cells more or less copiously collected which have undergone much oily degeneration. Here also caseation or puriform softening may take place.

The changes of the infiltrated parts are similar, except that the walls of the alveoli are not notably thickened.

The affections of the remaining viscera have been considered in the several chapters relating to the same organs in the acquired disease.

The Bones.—The discovery of the effects of syphilis on the skeleton of infants and young children is of quite recent origin. Before 1870, various authors[4] incidentally described structural changes in the bones of syphilitic children, without proving that the changes produced were

[1] Depaul: Gaz. Médicale. 1851, Nos. 50—51.
[2] Virchow: Archiv, Bd. xv., S. 310.
[3] Especially by Parrot and Cornil: Loc. cit.
[4] See Ranvier's case (Gazette Méd. de Paris. 1864, p. 596) of a syphilitic child in whom delay of ossification and disjunction of the epiphyses of the long bones were found.

peculiar to syphilis. In 1870, G. Wegner[1] described the syphilitic new growth, and his account has been substantially confirmed by all who have specially investigated the subject. Wegner was quickly followed by an independent observer, Parrot,[2] and to these two observers we owe our knowledge of the histological processes which alter the structure of the bone. Cornil[3] also has verified the descriptions of Wegner and Parrot by his own investigations, though he is unable to see any essential difference of structure between the bone-lesions in syphilitic children and the changes which may be produced by rickets.

Taylor of New York,[4] has collected a considerable number of cases observed by himself in living children, and has described most fully the clinical aspects of the affection. Reference may also be made to Waldeyer and Köbner[5] who confirmed Wegner's account of the changes in the long bones, and especially to Barlow and Lees[6] who have exhibited at the Pathological Society specimens of the cranial affections described by Parrot.

The osseous system is, according to Parrot, next to the skin, the structure most frequently invaded in inherited syphilis. The same observer maintains that the other tissues of the body come, in point of frequency, far behind these two. The lesions and their symptoms are very various, depending much on the bones attacked and on the form of the alterations produced in them. Rarely is the whole skeleton affected, nevertheless post-mortem examinations have shown that this sometimes takes place. The bones most frequently affected are the long bones of the limbs. Then those of the cranial vault, the ribs, the scapulæ and the iliac bones. The vertebræ and the bones of the hand and foot are least commonly involved. The typical bones are, according to Parrot, the tibia, the humerus, and those of the cranium. Taylor says that the humerus is less frequently involved than are the radius and ulna.

In the Long Bones the changes which take place may be divided into two chief forms; one comprising those which begin in the periosteum, termed by Cornil, *Periosteogenesis*. The second group

[1] Wegner: Virchow's Archiv. 1870, Bd. 50, S. 305.

[2] Parrot: Sur une Pseudo-Paralysie causée par une altération du système osseux chez les nouveau-nés atteints de Syphilis héréditaire. Archives de Physiologie, par Brown Séquard, &c. 1871—2, tom. 4, pp. 319—333, pp. 470—490, pp. 613—623. Also, Les lésions osseuses de la Syph. héréd. et de rachitis. Archives de Physiol. 1876, tom. 3, pp. 138—9. Pathological Trans. 1879, vol. xxx., p. 339. These essays contain Parrot's views fully set forth, with his exhaustive bibligraphical inquiry; but he has also published shorter communications in other periodicals, La Gazette des Hôpitaux, 1877, Le Progrès Médical, 1878, among several others.

[3] Cornil: Leçons sur la Syphilis. 1879, p. 297.

[4] Taylor: Bone Syphilis in Children. 1875.

[5] Waldeyer and Köbner: Virchow's Archiv. 1872, Band 65, S. 367.

[6] Barlow: Path. Trans. 1879, vol. xxx., p. 332; and at several meetings of the Society in the session of 1880.

includes those alterations beginning in and mainly confined to the ossifying line of the diaphysis; to which Wegner, who first described them, gave the name of *Osteochondritis*, and Parrot that of *Osteo-calcareous atrophy*.

Periosteogenesis.—Upon this form Parrot lays great stress, terming it the osteophytic change, and sub-dividing it into the *osteoid*, and *rachitic or spongioid* forms. In his opinion, this osteophytic change is the most constant and most important affection of the shafts of the long bones. It constitutes also one of the changes produced in the bones of the skull. It is, at first, an inflammatory affection of the periosteum.

The osteoid growth may be found at all ages; but in the later stages, it may undergo conversion into the spongioid form before being merged in the general growth of the bone. It is composed of more or less numerous interlacing trabeculæ which are disposed perpendicularly, or nearly so, to the axis of the diaphysis. The growth may be formed by a single layer; but in many cases several layers can be made out. The periosteum is nearly always thickened and clings closely to the osteophyte, which is infiltrated with a large quantity of calcareous salts that give it a chalk-like aspect. The bony swelling may vary from one-tenth to three-eighths of an inch in thickness on the shafts of the long bones, but may reach an inch or more on the flat bones of the skull. The line of demarcation between the natural bone and the new growth is usually sharply defined. The growths differ from normal bone by their whiter colour, by their greater friability, and by the ease with which they can be cut through or scraped off with a knife. The microscope shows that they have not the systematic structure of true bone. The osteoblasts are not regularly disposed around the Haversian canals, but instead, there are triangular or polygonal corpuscles similar to the stellate corpuscles of cellular tissue, which anastomose by their processes with the cells of the periosteum, and with the analogous corpuscles in the medullary spaces.

The spongioid or rachitic growth is only found in children more than five or six months old. It is formed of tissue of a pearly or slightly yellowish colour. Essentially fibroid in structure, it is more vascular than the normal bone and contains but little marrow.

These two principal forms are often combined. The growth may be made up of many layers; some more trabecular, others more spongioid in structure; but always so disposed that the harder layers are nearest the diaphysis and the most spongioid immediately beneath the periosteum.

During the development of the osteophytes, the proper shaft of the bone is but little changed in very young subjects; in older

children the shaft undergoes decalcification, and becomes separated into parallel layers by the development of furrows filled with medulla. Thus the shaft undergoes the spongioid transformation, becoming extremely light, porous, and brittle.

In addition to the increase of size which the end of the bone gains from the osteophytic outgrowth, it may be expanded at the epiphysis by proliferation of granulation tissue from the spongy tissue of the shaft. Thus considerable swelling of the end of the bone closely resembling rickets may be produced. Parrot points out that if the patient survive, the bones may lose all trace of the morbid growth; but this does not always happen, and then some deformity, such as a twist or bend, remains.

Osteochondritis.—The first steps in the production of this affection appear to consist in disturbance of the normal process of ossification by which the diaphyses of the long bones are lengthened. The rows of cells in the hyaline cartilage are preternaturally proliferated; and this excessive proliferation is continued throughout the course of the affection. Next, the calcification of the hyaline substance proceeds with much irregularity, but with great rapidity. Long promontories or even islands of opaque calcified cartilage penetrate in all directions; though they form a tolerably even incrustation where the calcification underlies the perichondrium. The naturally thin transverse line of ossifying cartilage becomes increased by this change to twice or thrice its normal thickness, and is no longer straight or slightly curved as in health, but wavy or even beset with projections, giving it an appearance likened by Wegner to that of the papillæ of the skin. Further, there is delay or total arrest of final development into true bone-tissue of much of the calcified intercellular substance.

There is also the *gelatiniform process* which Parrot states to be much more frequent than calcification. Wegner indeed describes both forms, but dwells at greater length on calcification. In the long bones, the gelatiniform change forms masses first in the ossifying line, and subsequently in the diaphysis, which vary in consistence; being sometimes firm like hard-boiled egg, sometimes as soft as an aqueous fruit jelly. The cartilage and the cancelli of the bone, where they have been elaborated, become gradually more and more sparse until they disappear, leaving merely a fibro-vascular network charged with water. The parts affected by this gelatiniform atrophy vary in colour from dull crimson or rosy in the earlier stages, to various shades of yellow in the later stages.

Thus, mingled together in the ossifying region, are calcified chalk-like masses, true bone, hyaline cartilage, and soft gelatiniform masses.

Wegner further describes as a very characteristic feature of this syphilitic change, the gradual permeation along the course of the blood-vessels of bundles of fibrous connective tissue, which pass through the cartilage, the calcifying layer, and the processes of spongy bone, until they penetrate deeply into the permanent cancellous tissue of the shaft.

The consequences of this arrested development are: first, loss of nutrition to parts of the calcified mass, which die and then act as irritants and excite inflammation, caries, and suppuration. The epiphysis is thus loosened from the shaft, abscess forms and the collected pus ultimately escapes by perforation of the periosteum into the surrounding integuments and becomes superficial. Thus a channel for the escape of the dead matter is provided. Parrot considers that loosening of the epiphysis and production of pus are rare events, and that the latter only occurs when traumatic irritation has also been at work.

In several cases pus has been found in the joint itself. Lees[1] reports the case of a child six weeks old who presented well-marked signs of inherited syphilis, and in whom the left elbow-joint and right knee-joint suppurated and opened spontaneously. The left knee-joint afterwards suppurated and was aspirated. The child recovered under mercurial treatment with fair movement in all the joints.

Greenfield[2] reports a case in which a man, who had contracted syphilis twenty-five years before, was found *post mortem* to have a condition of the long bones precisely similar to that found in infantile syphilis, allowance being made for the differences between a growing, and a fully-developed bone. The liver also in this case was the seat of extensive syphilitic hepatitis.

The Flat Bones.—The special changes have hitherto been chiefly studied in those of the head. Gelatiniform atrophy is rare according to Parrot. It always begins beneath the pericranium, and does not penetrate deeply through the bone which, when dried, presents a worm-eaten appearance. Sometimes the loss of substance has a punched-out aspect. The gelatiniform atrophy may begin during fœtal life; it is found only in very young infants, and may affect the whole calvaria. It cannot be detected till after death. This form has a certain relation to the dry caries of adults.

Osteophytes are only found in older children. They are nearly always met with at the periphery of the bones, and begin most usually around the anterior fontanelle; less commonly on the tem-

[1] Lees: Brit. Med. Jour. 1880, Nov. 6, p. 743.
[2] Greenfield: Path. Trans. 1876, p. 434.

poral bones. They are only formed on the orbital plates or on the occipital bone when the disease is very severe. At first they form lenticular projections of greyish or maroon colour, standing out in strong relief from the outer table. Though usually spongy and porous, the osteophytes are occasionally hard and smooth, like ordinary osseous tissue; they spread along the borders of the bones in a crescentic shape. The eminences of the parietal and frontal bones are the last parts of the skull to be invaded. The sutures may be soldered together so completely that post mortem it may be impossible to trace the point where the two bones joined.[1] The osteophytes may grow to three-quarters of an inch, or even to an inch and a quarter in thickness. Ultimately the new growth becomes harder and more dense by calcareous infiltration.

In the *short* and *irregular* bones, the affection begins by calcification of the ossifying line round the osseous nucleus; the changes which then ensue are identical with those observed in the epiphysial cartilages of the long bones. Parrot[2] records having discovered this change in the inferior maxillary bone, the sternum, the bodies of the vertebræ, and in the tarsal and carpal bones.

The Age of the children who are the subjects of these affections of the bones, cannot yet, for want of more complete observation, be exactly stated. The osteochondritis has hitherto been found most frequently about the sixth week after birth (Taylor[3]); but also in the immature fœtus,[4] as well as in infants not more than two years old. Cheadle,[5] however, has reported a case in which the tibia was thickened at its upper end in a syphilitic child aged three years and eleven months. Two cases of bone disease in children whose syphilis was acquired have also been reported. In the first of these cases, that of Roger,[6] a female child, two years old, contracted syphilis from its mother. The initial lesion was situated on the frænum of the upper lip, and was followed by roseola and mucous patches. Subsequently swellings appeared on the two humeri, the left tibia, and on the frontal bone. The child died. In Taylor's[7] case the child, whose age is not given, contracted syphilis from her younger sister. The radius, ulna, and the metacarpal bone of the right-index finger were the bones affected. In the cases of osteo-

[1] Barlow: Path. Trans. 1879, vol. xxx., p. 334.
[2] Parrot: Archives de Physiologie. 1872, pp. 328, 330.
[3] R. W. Taylor: Loc. cit., p. 121. See also a case by T. Smith, in which the child was one month old. St. Bartholomew's Hosp. Reports, vol. x., p. 204.
[4] Pollnow found osteo-chondritis in thirty-five out of fifty syphilitic fœtuses. (Der Hydrops sanguinolentus fœtus, &c. Berlin, 1874.)
[5] Cheadle: British Medical Journal. 1880, Feb. 7.
[6] Roger: Union Médicale. 1865, p. 249.
[7] R. W. Taylor: Loc. cit., p. 27.

phytic growths on the skull reported by Barlow and Lees,[1] the children were in their second and third years.[2]

Symptoms.—The pathological changes just described, besides causing alteration in the shape of the bones, render them also friable and yielding, so that fracture or bending or other deformities frequently ensue. From these changes result difficulty of movement and limited control of the limbs. Thus is often produced a condition of more or less complete inertia resembling that accompanying fracture, articular rheumatism, or even paralysis. Pain is not always present, but in some cases the slightest movement of the limb causes the child to cry out. When the upper limbs are affected, they usually lie along the trunk in a state of pronation. The lower extremities on the contrary are extended instead of being flexed as in health, and when the child is raised up they hang down and swing to and fro like the legs of a doll (Parrot). In some cases the inertia is so great that although the child cries out when the limb is pinched he makes no effort to withdraw it. Around the joints there is swelling, partly due to expansion of the bone, but not infrequently also to abscesses which form in the soft parts. Occasionally there is movement between the diaphysis and epiphysis and then crepitation may sometimes be felt. Respiration also may be impeded through breaking of the ribs. In a word, a condition of impotence may be produced which was at one time described as a pseudo-paralysis.

The changes in the long bones can often only be detected by careful palpation. In the examination of the humerus—one of the bones most frequently affected—the thumb and forefinger should be carried down the anterior and posterior surfaces of the arm, when the bone will be found thicker at the lower part of the shaft. This thickening becomes gradually more marked as the epiphysis is approached, and at the junction of that part with the shaft the increase of size is greatest. Of the tibia the internal surface is the part most frequently attacked, and the thickening is greatest about the middle of the bone, so that the surface is convex or arched instead of being slightly hollowed as in the normal state. Of the femur the outer surface and fore part of the shaft are the favourite seats. Beading along the ribs

[1] Barlow and Lees : Path. Trans. 1879, p. 352.

[2] While this chapter has been going through the press, Heubner (Virchow's Archiv, 1881, Bd. 84, 2tes. heft. S. S. 241-267), has published the clinical histories and postmortem examinations of two syphilitic children in whom the abscesses which were produced around the diseased bone were found to be quite unconnected with the changes in the epiphysial cartilages. In one patient the purulent collections resulted from a change of the proper tissue of the muscles attached to the bone into pus. The explanation put forward by Parrot and others respecting the origin of these abscesses, namely, the irritation of the epiphysial disjunction, does not therefore hold good in all cases. Veraguth (the same volume of Virchow's Archiv, s. 325), has also recorded some investigations into the earliest mode in which the ossifying cartilages are affected. He finds that the intercellular hyaline matrix undergoes fibrillation before the cells show the change described on p. 350.

and swelling of the costal ends are not uncommon; but the humerus, the tibia, and the femur are the bones where syphilitic enlargement is most frequently detected.

Parrot[1] describes as a rare occurrence, in children under three months old, one or more fusiform swellings in the continuity of the long bones. These swellings are, he says, formed by the callus of previous fractures in process of consolidation.

On the Skull, the osteophytes are most usually seen on the frontal and parietal bones; much less frequently on the temporal and occipital bones. When the swellings are present, they can always be felt and can sometimes be seen. To the touch they are hard and full, like projections of healthy bone. Their seats of predilection are the frontal and the parietal bones in the neighbourhood of the fontanelle. Ordinarily the swellings are symmetrically placed around the fontanelle, the four projections being separated by the coronal and sagittal sutures; but sometimes the osteophytes are limited to the frontal or parietal bones. When the child is sufficiently old, the place of the ossified fontanelle is usually occupied by another projection. In some cases the posterior enlargements become very prominent, and give to the region which they occupy the appearance termed by Parrot 'natiform.'

Instead of the circumscribed projections just described, the osteophyte sometimes takes the form of a bony ridge which can be traced along the sides of the sagittal suture. In this affection of the skull rapid closure of the sutures is liable to take place, and, according to Parrot, may so affect the brain that idiocy results.

Besides the purely syphilitic changes, other alterations of the calvaria may also ensue, namely:—*Plagiocephalus*, or oblique flattening at the points where pressure is most frequent; and *Cranio-tabes*, or thinning and even perforation at certain spots of the bony tables, the result of continual pressure of the brain within and of the pillow without. Barlow and Lees[2] have collected and carefully tabulated 100 cases of cranio-tabes. In forty-seven of these the authors were satisfied as to the existence of syphilis. In about forty more of the cases there were indications of syphilis of greater or less value, while in twelve only could no evidence of syphilis be found. Hence syphilis is a large factor in the causation of cranio-tabes.

Diagnosis.—Syphilitic enlargements of the skeleton in young children have to be distinguished from the enlargements due to rickets, from hereditary exostoses, and from necrosis of the ends of the shafts of certain of the long bones. The two latter affections are so distinct in their form, history, and course as to need no descrip-

[1] Parrot: Gazette des Hôpitaux. 1877, No. 111.
[2] Barlow and Lees: Lancet. 1880, vol. ii., p. 814.

tion. The diagnosis from rickets is at times difficult and probably in some children impossible. Parrot,[1] indeed, is of opinion that rickets is only one of the ultimate stages of inherited syphilis. Nevertheless, in the majority of cases the differences are sufficiently clear for a positive diagnosis to be made. In the first place there will often be a history of syphilis in the parents as well as other signs of syphilis in the child. To these may be added the characters peculiar to this syphilitic affection, which appears soon after birth, or even in utero, while in rickets the bone change does not begin till the child is six months old and often not until several months later than that. The syphilitic bone change also is not preceded by the restlessness and sweating which are so marked in the case of rickets. As rickets advances the swellings of the bones affect the skeleton generally and symmetrically, the ribs never escaping; while in syphilis, though many bones may be attacked, it rarely happens that the corresponding bones of the two sides of the body are equally or similarly affected. The subsequent course of rickets is to cause thickening and bending of the bones, but never suppuration nor necrosis; while in syphilis the subsequent course is to resolution, though there is a strong tendency to necrosis, consequently abscesses and sinuses are not infrequent. The special malformations also vary in the two affections of the cranial bones. Syphilis attacks most obviously the frontal and parietal, and forms eminences there which encroach upon the fontanelle. The syphilitic change also causes early closing of the sutures and of the fontanelle itself. In rickets, on the other hand, the sutures and fontanelle remain long open, and there is no prominent thickening of the frontal and parietal bones. In the long bones, the loosening of the epiphysis from the shaft, not very uncommon in syphilis, is never seen in rickets. The enlargement of the fingers and toes known as dactylitis is also no part of rickets. When the bones are examined after death, it is seen that the subperiosteal osteophytes are compact. The broad line of calcification at the epiphysis of the syphilitic bone is wanting in rickets, as are also the masses of gelatiniform atrophy. The change in rickets consists of decalcification of the growing bone, production of spongioid bone, and speedy medullisation of the new structure, which thus becomes more vascular than normal bone, instead of withering from malnutrition as in the syphilitic form of disease.

Prognosis.—This is always grave for two reasons, (1) These peculiar changes in the bones are met with only in children severely affected by the diathesis, consequently the termination is frequently fatal. (2) The changes, by affecting the rigidity of the skeleton, may

[1] Parrot: La Syph. héréditaire et le Rachitis. Progrès Médical. 1880, Nos. 31, 34.

injure the viscera. Thus, the development of the brain may be checked by the early closure of the sutures. The lungs may be gradually compressed by want of rigidity and frequent fracture of the ribs. The friable bones of the limbs may break from slight strain, or abscesses and fistulæ may form in the soft parts and in the joints; or other deformity may ensue. But on the other hand, if the patient resist the influence of the diathesis, the tendency of the affection is to resolution, and the bone in the course of a few months may regain most of its normal condition if anti-syphilitic treatment be employed.

The Teeth.—There are no special peculiarities in the milk teeth of children who suffer from inherited syphilis. In the *permanent* set of teeth a peculiar change, affecting particularly the upper central incisors, was first pointed out by Hutchinson.[1] The chief peculiarity consists in a general dwarfing of the tooth, which is both too short and too narrow; but it is broader at the neck than at the cutting edge, hence the term 'pegged' which has been applied to these teeth. The cutting edge of the tooth, however, instead of remaining pointed, soon breaks or wears away in an irregular manner and leaves a single shallow semilunar notch at the centre. At the bottom of this notch the enamel is deficient and the dentine exposed. This notching or deformity is best seen in the two central incisors of the upper jaw, and these are the only teeth which afford conclusive evidence. The other teeth are very often malformed also, but not in a characteristic manner; therefore, in testing the question of syphilis the attention should be confined to the central upper incisors. Syphilitic teeth are badly developed and stunted in their growth; they sometimes slant together and sometimes are widely separated, but are almost always considerably smaller than ordinary teeth. Moon[2] believes that the peculiar shape results from a stunted development of the first formed portion of dentine—in other words, a dwarfing of the cusps. He also believes that the single central notch on the cutting edge of the tooth is due to a greater diminution in the size of the central than of the lateral lobes. The same observer[3] has likewise pointed out that the permanent first molars of syphilitic children are frequently reduced in size, and of a dome-like shape, from suppression of their angles; and that the enamel is absent from the grinding surface.

With regard to *diagnosis*, Hutchinson remarks that it is not in the cases where very conspicuous defects are present in the teeth

[1] Hutchinson: Path. Trans., vol. ix., p. 449, vol. x., p. 287. Also, On certain diseases of the Eye and Ear, &c. 1863, p. 204; and Illustrations of Clinical Surgery. 1878, Fasciculus xi.

[2] Moon: Monthly Review of Dental Surgery. 1877, June 15.
Moon: Bryant's Practice of Surgery, 2nd ed., vol. i., p. 541.

that syphilis is most to be suspected. A rough pitting or honeycombed state of the teeth is very common, and is due, in Hutchinson's opinion, to stomatitis produced by the administration of mercury, or by other causes during infancy. This condition of the teeth has nothing whatever to do with syphilis. Owing, however, to the frequency with which mercury is given to syphilitic infants, the peculiarities caused by syphilis and those due to mercury are not uncommonly met with in the same individual. The first permanent molars are the teeth which always and in the greatest degree show the roughness and pitting due to stomatitis; next come the four incisors and the canines, while the two premolars escape.

Late forms of Inherited Syphilis.—Respecting these our knowledge is still imperfect. Persons who have been infected before birth may suffer from various destructive affections during their time of growth, and even during the third decade; and from liability to such attacks probably no organ is exempt. The most common periods for the appearance of these affections are, during the second dentition; on reaching puberty; and during the ossification of the epiphyses and general knitting of the frame. The morbid changes affect any part of the body for a time only, after which the destructive action ceases and cicatrisation sets in, leaving permanent loss of tissue or impairment of function of that part, while the disease may still continue its ravages elsewhere. The consequences to the individual are various. Not infrequently his body is puny, stunted, or deformed, and his intellect may be checked in development, even to complete idiocy. The changes that affect the brain are notified by epilepsy, loss of memory, loss of perceptive power and gradual imbecility.

The local changes of inherited syphilis are often confounded with scrofulous disorders. The skin is very prone to ulcerate. A common situation for these ulcers is around the mouth and nostrils, where they leave linear and radiating scars; but they may occur in any other region. In addition to the stunted development of the individual, the complexion is often muddy, or earthy, and the hair thin and brittle. The lymphatic glands, especially those of the cervical region, may slowly enlarge, suppurate, and involve the skin in the ulceration thus set up. The bones, especially those of the cranium, are thickened, whereby flattening of the vertex and widening of the forehead and of the occiput are produced. The shafts of the long bones are often the seat of nodes which produce considerable deformity. The delicate bones of the palate and nose are very liable to be destroyed by gummy osteitis, the bridge of the nose sinks, and the spongy bones and more or less of the hard palate

may be cleared away. The mouth, nose and pharynx may thus be thrown into one cavity. The soft parts of the mouth, particularly the velum, pillars, and pharynx are generally involved in the extensive destruction of the bones. The teeth are often deformed in the manner already described. The eyes may be the seat of corneitis, iritis, or choroiditis; of which affections the two latter usually leave permanent traces. Deafness may also occur about the time of puberty or later. So also the viscera—the brain, the liver, the spleen, the lungs, the heart, the kidneys—are liable during this period to changes which seriously impair their functions. These affections have already been described in previous chapters. We need not remind our readers that though all these symptoms do not present themselves in the same individual, they may be all displayed in different members of the same family.

Duration.—The duration of inherited syphilis in those patients who do not quickly succumb has no definite limit. If the child be properly treated the course may be completed in three or four months, and no after consequences in adolescence may ensue. On the other hand, a comparatively small number of children are attacked at short intervals throughout their period of growth, and even in manhood. Consequently, the duration of the disease ranges between three or four months and twenty-five or thirty years, but throughout this long period it can be greatly influenced by appropriate anti-syphilitic treatment.

Diagnosis.—In infants who inherit syphilis from their parents, the initial lesion and its concomitant glandular enlargement are of course absent. The earliest and most constant symptom is coryza accompanied by the well known 'snuffling.' This is usually soon followed by cracks and excoriations of the nostrils and around the mouth. Wasting is often an early and prominent symptom, and the peculiar cry, sleeplessness and restlessness may also afford help in forming the diagnosis. The eruptions on the skin which soon follow the earlier symptoms, together with mucous patches which are almost invariably present either about the mouth, genital organs, or anus, are also valuable signs. Pemphigus of the palms and soles is pathognomonic. Enlargement of the spleen should always be felt for, and if present is a valuable corroboration. The condition of the bones of the skull, the humeri and tibiæ should also be examined for the several lesions which have been already described. But the diagnosis will often depend on the multiplicity of the affections present, rather than on the evidence furnished by any single pathognomonic sign.

It must not be forgotten, however, that a child sometimes suffers remarkably little in its general health and that the disease may run its course without materially affecting its nutrition or its appearance

of health. A careful examination is necessary in such cases for the discovery of the taint.

The diagnostic signs of inherited syphilis in childhood or adolescence are the low stature and puny development of the body; the peculiar condition of the teeth; the thick pasty and greasy appearance of the skin especially of that of the face; the scars about the mouth; the sunken bridge of the nose; the prominent forehead; the signs of present or past mischief in the cornea, iris, or choroid; swellings on the bones; phagedænic ulceration or its scars, especially of the face and throat. The condition of the teeth, when well-marked, is perhaps the most valuable sign; but in adult life the teeth are usually too much worn for the peculiarities pointed out by Hutchinson to be recognised. In the absence of obvious marks on the surface of the body the careful examination of the eyes will often furnish evidence of the highest importance. The nature of these changes have already been described in the chapter on Affections of the Eye. When no conclusive evidence can be gained from the appearances presented by the patient, a minute inquiry into his early history and into that of both his parents will often furnish satisfactory proof. Otherwise, the diagnosis must be postponed until the effect of specific treatment on the particular affection has been ascertained.

Prognosis.—The prognosis of inherited syphilis depends upon the condition of the parents and the condition of the child. The modes in which the parents' syphilis may influence the child have already been fully set forth (Chap. II.)

The Condition of the Child.—The longer the interval between birth and the appearance of the symptoms, the more probable does recovery become. Two conditions of the child itself mainly influence the gravity of the prognosis. First, the degree of general cachexia or general enfeeblement. A puny wizened child, which quickly becomes covered by eruptions, will almost surely die. The appearance of ecthymatous pustules is also bad for the prognosis. The irritation of the skin attending superficial ulcers, or ecthymatous pustules, is frequently the cause of exhaustion which ends in death. The second condition which influences the prognosis is the degree to which local affections hinder nutrition. Thus, hepatic disease causes vomiting, diarrhœa, and otherwise prevents digestion. According to Gee, if the spleen be very greatly enlarged the child usually dies. The nasal catarrh, again, blocks up the nose, so that the child cannot breathe through his nose while he sucks, and he is thus put in danger of starvation. Nasal catarrh is also often followed by bronchitis and lobular pneumonia. The prognosis is less grave if the disease be late in showing itself, and is favourable if the

rash be confined to one or two places on the body, or to mucous patches round the anus. A good result may be expected if the child's nutrition proceed favourably, if his skin remain fresh-coloured and well supported by subcutaneous fat, if the nasal catarrh be too slight to impede the power of sucking, if the digestion be good, and the bowels regular.

The prognosis of the later forms of inherited syphilis is favourable if the true cause of the disease be made out and appropriate treatment instituted. If however, as is often the case, the destructive affections of the throat or face be treated as 'scrofulous,' irremediable loss of tissue and deformity will probably occur. If visceral disease also is not recognised as syphilitic, a fatal result commonly ensues.

SYPHILIS.

CHAPTER XV.

DISEASES CONFOUNDED WITH SYPHILIS.

Chancre.—The distinctions between the local venereal ulcer and the initial sore of syphilis, though many and marked, have not yet prevailed sufficiently to command a general belief in the absolute diversity of this disorder from syphilis. Nevertheless, that creed is steadily gaining ground, and, as already stated in the Introduction, is the one held by the writers. These points of difference, as well as a few others which are considered by some to indicate relationship to syphilis, will be set forth in the following pages.

The source of the two affections is invariably distinct: the comparison or confrontation of diseased persons with those from whom they contracted their malady, has well established the fact that no patient contracts the initial lesion of syphilis from a person free from constitutional disease. Again, the chancre has no incubation; the effects of its inoculation begin to develope directly the pus has touched a breach of surface, and in twenty-four or thirty-six hours a characteristic sore is produced. Syphilis has its period of incubation extending over several weeks, and until that time is passed, no change whatever at the site of inoculation is perceptible, provided the vehicle of the virus be not purulent. When artificially propagated by puncture of the skin, the chancre begins with a pustule, which rapidly changes to a spreading ulcer. The initial lesion of syphilis begins as a papule, and rarely, if ever, produces a pustule; it is slow to cause ulceration, which process indeed may be absent throughout the whole course of the initial affection.

The characters of the two sores during their increasing, stationary, and declining stages, are widely different. Chancre can be destroyed by caustics, and the disorder ends with this destruction. The cauterisation or even the excision of a syphilitic sore is no bar to

general syphilis. Chancre is a disorder which may be undergone by the patient an indefinite number of times. Lindmann[1] successfully inoculated himself more than two thousand times with the pus of soft chancres without exhausting his capability of producing a pustular ulcer. Syphilis, in the vast majority of instances, is contracted but once by those exposed to its contagion. Again, *pus* is necessary to produce a chancre, probably indeed the pus-corpuscles themselves are the essential constituent; whereas the initial lesion of syphilis may be produced by employing any fluid of the body if it be mixed with the blood of a syphilitic person; the blood alone is also capable of propagating syphilis.

The discharge of a chancre is readily inoculated on nearly all persons, and the newly created sores themselves will propagate others by successive inoculations for a long series, witness Dr. Lindmann. The discharge of a hard sore is not inoculable on its bearer, unless it be in a state of suppuration accidentally or artificially produced, and even then not certainly so. Lastly, the chancre has been propagated to animals, and the discharge of the new sores successfully implanted on human beings. Diday,[2] never having had syphilis, inoculated himself on the penis with matter taken from an ulcer he had produced by inoculating chancrous pus on the head of a cat. Irritation followed immediately, and an ulcer formed in a few days, which spread rapidly and produced a troublesome bubo that did not heal for months. The pus of this bubo was successfully inoculated on a rabbit. No constitutional syphilis followed these inoculations, and Diday assures us that he had not been affected with constitutional syphilis previously. This then is an excellent example of inoculating venereal pus without producing syphilis. Robert de Weltz[3] took matter from a chancre that he had produced in the same way on a monkey's ear, and inserted it into his own arm. This experiment succeeded so well, that he had a most troublesome ulcer, enlarged glands and abscess; but no general syphilis. True syphilis has not yet been proved to be communicable to any of the lower animals.[4]

With regard to the essential element of the syphilitic virus it has already been mentioned in speaking of Lostorfer's experiments on the blood that nothing definite is yet known on the subject, consequently evidence of this kind is not at present available for still further proving the distinctions between syphilis and other disorders. It may be mentioned however that Klebs[5] has described certain

[1] Lindmann: quoted by Fournier: Leçons sur le Chancre. 1860, p. 335.
[2] Diday: Gazette Méd. de Paris. Dec. 27, 1861.
[3] De Weltz: Ricord, Lettres sur la Syphilis, No. 15.
[4] See Chapter II.
[5] Klebs: Beiträge zur. path. Anat. 1880. ii. Heft. s. 87.

slowly-moving rods which he found in the juice of the syphilitic initial lesion, and which he believes to be peculiar to syphilis. Bermann [1] of Baltimore also reports that he has found micrococci similar to those described by Klebs. But further research is required before the presence of these bodies can be held to be diagnostic of syphilis.

The process of '*syphilisation*' also affords valuable evidence of the distinctions between syphilis and the local chancre. This method was first conceived by Auzias Turenne in 1850, as a possible means of exhausting the patient's susceptibility to constitutional infection, and was taken up by Sperino,[2] Boeck,[3] Bidenkap [4] and others on the continent, who employed it widely in the treatment of syphilis. A trial of this method was also made by Heron Watson [5] in Edinburgh, and by Lane and Gascoyen [6] in the London Lock Hospital. The report of Lane and Gascoyen embodies in a careful summary the greater part of what is known concerning this pathological experiment.

Syphilisation has for its main features, immediate irritation at the place where the matter is inserted; production of a pustular ulcer on the third day after insertion; and reinoculability of the discharge of this ulcer. This contagious property remains for a considerable space of time, though the ulcers successively produced get gradually smaller and smaller, until the skin becomes temporarily insusceptible of further irritation by this means. The consequences of this procedure are confined to occasional phagedæna of the ulcers themselves, and tenderness, enlargement, and now and then suppuration, of the nearest lymphatic glands. Individuals are said to differ in susceptibility, some are with great difficulty, others only when in good health, brought into a state proper for the success of these inoculations. Matter may be taken for artificial inoculation from a hard or soft sore indifferently; those using it only require that the ulcer be in a state of progress, and suppurating freely. If it have ceased to suppurate, the application of an irritant suffices, in reviving its spreading suppurating character, to restore the inoculable quality to its secretion.

The means by which an indurated non-suppurating sore can be

[1] Bermann: Archives o Medicine, Dec. 1880, p. 263.
[2] Sperino: La Sifilizzazione difesa. 1853.
[3] Boeck: Recherches sur la Syphilis publiées aux frais du Gouvernement. Christiania. 1862.
[4] Bidenkap: Aperçu des différentes méthodes de traitement employées à l'Hôpital de l'Université de Christiania contre la syphilis constitutionelle. 1863.
[5] Heron Watson: Evidence before the Committee on Contagious Venereal Diseases. 1865. Q. 4671, &c.
[6] Lane and Gascoyen: Med. Chir. Trans. 1867, p. 281. See also Schwabach ü. Lewin [Inaugural Dissertations. Berlin, 1870], who experimented on twenty different cases. In one an inoculable sore followed the employment of pus from syphilitic lupus.

made to secrete an inoculable pus were first explained by Henry Lee,[1] who, in his experiments at the Lock Hospital, inoculated on syphilitic persons the secretions of their primary sores. The inoculations were successful when the ulcers were artificially irritated and secreting pus; but unsuccessful when the sore was no longer irritated. Similar cases are scattered through other works, which prove the occasionally irritating quality of the pus from indurated ulcers.

Some of the results obtained from this now obsolete practice of syphilisation, clearly show the different effects of inoculating the matter of suppurating sores when taken on the one hand from persons free from syphilis, and on the other from those infected with that disease.

The following case shows that the pus of chancres does not contain the syphilitic virus, and also that the discharge of a hard sore is not deprived of its syphilitic property when irritated to suppuration.

Danielssen,[2] surgeon in the Hospital of Christiania, tried syphilisation to cure leprosy in twenty cases. In every experiment but one he used the matter of soft suppurating chancres. These inoculations ran through the same course as those made by his colleague Boeck on syphilitic persons—irritation was immediate; ulcers formed in three days, and the pus was reinoculated for three or four months, until the patients were no longer susceptible to this irritation; but without any benefit to their leprosy. The exceptional patient was 'syphilised' like the rest with soft chancrous pus from April to September, 1857. By this time he had undergone 393 inoculations, of which 287 had formed ulcers. In the middle of September he appeared to be reaching insusceptibility, but his leprosy was unaltered. On 28th September, 1857, matter from a hard suppurating sore was used. This produced a pustule in the usual three days; successive generations of matter originating from this hard sore were inoculated on the patient until 17th October, when the pus of these artificial sores lost its efficacy and all attempts at inoculation with matter from any source were fruitless. On 13th November, the scar of the inoculation of the 28th September (that made directly from the hard sore), broke down. In a week the sore had reached a length of three-quarters of an inch, and the neighbouring lymphatic glands were enlarged. In January, 1858, the patient had an eruption on the scrotum; in February, ulcers of the fauces and other signs of syphilis. It is also interesting to note that syphilisation was tried again in 1858 on this patient, and went on as successfully, as if he had not been subjected to it during many months of the previous year.

The anatomical structure of the two venereal sores is also dissimilar. Cornil[3] thus compares the initial lesion of syphilis with the simple chancre. In the former there is sclerosis of the dermo-papillary tissue, and thickening of the walls of the blood-vessels by infiltration with new cells; the superficial epithelium and the

[1] Henry Lee: Lectures on Syphilitic Inoculations, &c., 1863, pp. 222—224.
[2] Danielssen: Deutsche Klinik. 1858, S. 322.
[3] Cornil: Loc. cit. p. 55.

mucous layer are preserved in part, even on the eroded or ulcerated surface, and there remain almost constantly patches of cells of the mucous layer. The scanty secretion contains a relatively small number of lymphatic cells. In the *simple chancre* we have a gaping hollow formed by the rapid and complete destruction of the superficial and deep layers of the epidermis, and by the progressive suppuration and liquefaction of the papillary and dermic layers. The papillæ, the connective tissue of the derma, and the subdermic tissue are transformed into a granulation tissue, in which the vessels are not at all sclerosed, but in which the fibrous framework is disintegrated and destroyed.

After this summary of the leading differences between chancre and syphilis, some facts which have been construed as indicating relationship between the two may be mentioned. The first is the large number of times that the pus of both venereal sores can be propagated by repeated transplantation. It is true, experiment has shown that inoculable sores may be produced from all kinds of purulent matter—venereal or non-venereal. Nevertheless, this contagious quality is soon exhausted unless the matter have a venereal origin. But the pus of the local chancre in this respect far outdoes the discharge of the initial lesion, which, moreover, is inoculable only when puriform, and even then in most cases certainly, and probably always, loses its contagious quality after eight or ten repetitions. Another way in which attempt has been made to prove kinship of the local chancre with syphilis is Clerc's theory—one much in favour twenty years ago, and still maintained by some writers.

Clerc[1] considers that the principle exciting the local ulcer, which he calls 'chancroid,' is a hybrid of the virus of syphilis; he likens it to abortive vaccinia, or abortive variola (varioloid); and believes it to be generated thus: the pus of a primary syphilitic sore when implanted on a healthy person, first passes through a period of incubation, then produces the infecting sore, and subsequently the general disease. If the same ulcer be resorted to for a second supply of matter, and this be inoculated on a person who has previously suffered from syphilis and recovered, a different result is attained; the point of introduction at once inflames, producing a vesicle in forty-eight hours, and, shortly afterwards, the ulcer known as the soft chancre. The matter of this sore, if taken to a person who has never had syphilis, produces a similar result in him, namely, an immediate ulcerative inflammation, and usually no subsequent general disease. *Usually* no general disease, because Clerc,

[1] Clerc: Traité pratique des Mal. Vén. Paris, 1866.

for the perfection of his theory requires that it shall sometimes confer general disease, plus the immediate ulcer. Thus, in his opinion, the principle of the local contagious ulcer becomes established as a separate entity, and shows its connection with the parent virus of general syphilis, by occasionally propagating that malady.

The possibility suggested by Clerc, that the syphilitic virus is sometimes essentially (not by accidental admixture) contained in a communicable condition in the pus of the local chancre, was not established by him on satisfactory evidence; nor has it been proved by others, notwithstanding that theories more or less similar to Clerc's have been frequently put forward to establish a connection between the two contagious principles.

Emile Vidal [1] has reported three cases where the initial sore was supposed to be free from induration and to possess the character of the local chancre. But his cases do not bear examination. In one patient, a rag-picker, *five months* had elapsed between the treatment of the soft sores and the appearance of the general symptoms. In these five months the patient had not been under observation in hospital, but had been pursuing his avocation in the streets and frequenting the society of the other sex. Moreover, when he was examined by Vidal, he had a phimosis, which prevented a minute and complete examination of the genitals. In another case, the patient had two soft sores of the furrow behind the glans; and though the sores themselves did not harden, a mass of induration as "large as the kernel of a plum-stone" formed. In the third patient no induration was detected in his sores, but the man was habitually visiting two mistresses, and was quite unable to assign the probable date of his infection. Hence, it is by no means sure that the soft sores which preceded his syphilis were the initial lesion.

It may be well here to dispose of a supposed connection between the contagious local sore and syphilis, which the late Mr. Morgan of Dublin maintained that he had discovered. Some years ago Morgan [2] reported that he had been able during a long series of experiments to produce a suppurating inoculable ulcer on women constitutionally syphilitic by inserting muco-pus from the vagina into the skin, either of the patient from whom it was taken or of other syphilitic female patients of the Dublin Lock Hospital. Morgan failed to detect any ulcer or breach of surface of the vagina from which the discharge was taken. These experiments attracted attention at the time and were repeated by others; but in no case, so far as we are aware, did results like Morgan's follow. Sharply cut sores which spread and suppurated freely, and could be propagated again by inoculation, were produced by other experimenters only when some ulcer was present on the genitals of the women whose vaginal muco-pus had been employed. The late Mr. G. G. Gascoyen [3] repeated Morgan's

[1] E. Vidal: L'Union Médicale. 23 Jan., 1873.
[2] Morgan: Dublin Quarterly Journal of Medical Science. August, 1870.
[3] Oral Communication.—B. H.

experiments on twenty female patients at the London Lock Hospital. In only one case did Gascoyen produce an ulcer by his inoculations, and in that instance he discovered that he had overlooked a small sharply cut ulcer of the entry to the vagina. Gascoyen's experiments were, like Morgan's, limited to syphilitic women, but in his cases each specimen of muco-pus was inoculated only on the woman who furnished it. No transference from one patient to another was attempted. In the face of the fact that no one has yet succeeded in arriving at Morgan's results with the means he employed, it is difficult to avoid the belief that he was mistaken in supposing ulceration to have been absent from the genitals of the women whose discharges he employed in his experiments.

The following cases, recorded by Bidenkap,[1] have been put forward as furnishing strong evidence of a relationship between syphilis and the local chancre.

A girl was admitted into the hospital of Christiania in 1862, for a vaginal blennorrhagia, but free from syphilis, as will be seen from the sequence. She was placed in a ward where syphilisation was being performed on other patients. On Nov. 28, she inoculated herself with a pin dipped in chancrous pus taken from an artificial ulcer on one of the patients that had been carried through many generations from what was reported to have been originally an infecting chancre. The girl concealed what she had done for a week, till the inoculation succeeded, and produced a round ulcer as large as a pea, with sharp borders and a red areola; the ulcer suppurated freely, but did not indurate. During the next three weeks it increased in size; and some of the glands of the axilla enlarged for a short time. After this the ulcer slowly healed. On the 5th March, three and a half months after the inoculation, the patient was discharged with a bluish, slightly elevated scar, but there was no induration, and no enlargement of the glands, or other trace of syphilis. The patient was examined by Bidenkap regularly once a week till the summer of 1864, when she contracted an ulcer of the genitals which was followed two months later by roseola, and other constitutional affections. Another girl, about the same time, played the same trick upon herself, and in three or four days pustules formed at the sites of inoculation. She had in this wise produced 18 ulcers before she announced what she had done, and Bidenkap continued the series through 12 more inoculations with the pus of the ulcers which the girl had propagated upon herself. In this patient the ulcers had a similar course of four months' duration, but were more irritable and became somewhat thickened. Five months later, being quite well, without symptoms of syphilis, she was discharged. For several months longer she was examined at regular intervals, but remained free from syphilis.

At first sight these cases seem to support the view of those who believe in the unity of the virus of syphilis and that of the local chancre. The original source of the pus used in these inoculations was said to have been an infecting chancre—in other words, a suppurating hard sore—on a person infected with syphilis; consequently

[1] See Auspitz, quoting from Bidenkap's "Om det Syphiliske Virus," Christiania, 1863, in his Lehren vom S. Contagium, p. 236. Vienna, 1866.

the matter ought to have produced syphilis on these girls, or at least on the former of them, who was proved to have been virgin of syphilis at the time she inoculated herself as above described. It must be remembered, however, that the pus used had been inoculated on others *through many generations*, and that it would not have been so freely and for so long a time inoculable unless it had been originally taken from a chancre, or at any rate a "mixed sore." The escape of the girls from syphilis may therefore be easily explained by the fact that whatever syphilitic poison might have been originally present, had died out during the many generations through which the pus had been re-inoculated, and that the chancre virus alone remained. That the matter was taken by the girls from syphilitic patients proves nothing; for we know that the discharge of non-syphilitic lesions on the bodies of syphilitic patients usually fails to produce syphilis unless the blood be inoculated as well. The cases of vaccination and others related in Chapter II. furnish ample evidence on this point. Thus the circumstances, even if genuine, might be explained. But, in truth, the cases have little claim to serious consideration; for the most important points connected with them appear to have rested solely on the statements made by the women themselves.

In fine, it appears clear from what has been said, that in the present state of our knowledge there is no sufficient evidence to justify the opinion that syphilis has any relation to chancre.

Tubercle.—The exact amount of influence which syphilis exerts in producing tubercle has still to be ascertained. This much is certainly known: a large proportion of the men invalided for tuberculous disease in the army and navy have also suffered from syphilis. It is justifiable to assume that the constitutional debility caused by syphilis may favour the development of tuberculous disease in persons who have no hereditary predisposition to it: thus syphilis would become a predisposing cause of tubercle. Again, the production of tubercle in persons already predisposed to its formation may be assisted by the debility and mal-nutrition which syphilis induces; thus syphilis would become also an exciting cause of tubercle. Syphilitic disease of the lungs causes a phthisis that in its general course is not unlike tuberculous phthisis; but it is, nevertheless, distinct from tubercle. There is no satisfactory ground for supposing that syphilis and tubercle are connected together, still less for supposing tubercle that is in any way a form of syphilis.

Scrofula.—As the knowledge of syphilis extends, numerous affections previously assigned to scrofula are ascertained to be wholly syphilitic, such as the affections of the skin, eyes, and bones which develope in later childhood after syphilis in infancy. It is probable

that syphilis may be an excitant of scrofulous disease when there is predisposition to that affection, in the same way that it favours the production of tuberculous disease, but there is no evidence that any truly scrofulous disorder is a commuted form of syphilis. Scrofula attacks the skin, lymphatic glands, and bones—the parts most frequently attacked by syphilis; but scrofula always tends to slow inflammation and abscess, while syphilis has no special tendency to suppuration; the matter of tertiary ulcers is mainly *débris* of degenerated solid deposit and not true pus, the product of inflammation. In the viscera, scrofula produces amyloid disease, but solely by causing prolonged suppuration in some part of the body; syphilis is also a cause of amyloid disease, but it may excite that morbid change quite independently of suppuration.

Leprosy.—The distinctions between syphilis and this disease are well defined: perhaps the greatest are the non-contagious character of leprosy, its incurability by mercury, and the different nature of the pathological changes produced by it. The tubercles of leprosy resemble the tubercular syphilide only very slightly, being often colourless, and scattered mainly over the extremities. They are, moreover, permanent. The ulceration of leprosy is usually more severe than that occurring in syphilis. The local loss of sensibility and the enlargement of nerve-trunks met with in leprosy are no part of syphilis. The slow continuous course of leprosy, the absence of periods of inactivity and temporary disappearance of symptoms which occur in syphilis, together with the little influence treatment exerts over leprosy, are also useful distinctions. The report of the Royal College of Physicians on leprosy in 1866, and that of Danielssen and Boeck[1] to the Swedish Government on the same subject, furnish us with ample evidence that syphilis and leprosy have nothing in common.

Mercurial Poisoning.—Mercury cannot excite the affections that syphilis evokes. This fact has been strenuously denied even during the present century. Opinions of this kind obtained importance sufficient to induce observers to investigate their correctness very closely, and no one has done so with more success than Kussmaul,[2] professor of medicine at Erlangen, where, and in the neighbouring town of Fürth, the manufacture of mirrors is largely carried on. Hence a large number of sufferers from mercuric poison was afforded him for observation. Kussmaul compared with much minuteness the symptoms of mercurial poisoning with those of syphilis. He collected observations of the latter disease occurring in persons who

[1] Boeck: Traité de la Spedalsked ou Elèphantiasis des Grecs. Paris, 1848.

[2] Kussmaul: Untersuchungen über den constitutionellen Mercurialismus und ihr Verhältniss zur constitutionellen Syphilis. Würtzburg, 1861.

had taken no mercury for its cure; also, other cases of persons suffering from mercury and syphilis simultaneously; and lastly, observations of mercurial poisoning where syphilis was absent. His examination showed clearly that the mercurial poison produced no single affection or symptom that is identical with or not to be distinguished from those belonging to syphilis. Again, in persons exposed to mercury by the practice of their trade, syphilis is not altered in its aspect; consequently, we cannot speak of the combined effects of mercury and syphilis. Mercury has but one influence over syphilis, viz. to control many of its symptoms; it can in no way unite with the virus to produce effects compounded of the two poisons. In some respects it seems to shield the individual from the contagion of syphilis, as Kussmaul could not find an instance of a worker in mercury *contracting* syphilis while affected by the drug. Those who did suffer from syphilis had contracted it either before they were mercurialised, or after they had recovered from the mercurial tremor and salivation.

SYPHILIS.

CHAPTER XVI.

DIAGNOSIS.

THE Diagnosis of the different forms of syphilitic disease of the several regions and organs of the body has already been considered in the preceding chapters. It may be useful, however, to add a few general remarks on the diagnosis of syphilis as a whole, and to recall briefly the chief points to be borne in mind in the investigation of a particular case.

The diagnosis may be easy or difficult according as the symptoms of syphilis are well-marked or the reverse; but supposing that nothing is found on the patient's body, the diagnosis will often depend on the account which he is able and willing to give of himself. Again, the stage at which the disease has arrived when the patient first comes under observation will greatly affect the solution of the problem. In the earliest period; that is, before induration of the initial lesion is present, as in cases where a sore appears a few days after exposure to contagion, the exclusion of syphilis will be impossible until the period of incubation proper to that disease has elapsed. When incubation is over the diagnosis is generally easy, the induration of the initial lesion with its accompanying adenopathy being characteristic. Sometimes, however, the injudicious application of irritants to a simple sore will excite an inflammatory thickening of its base, which for a time much resembles the syphilitic induration. A single gummy ulcer of the genital organs has also often been mistaken for the initial lesion; but the absence of glandular enlargement and the history of the case will usually decide the point.

Supposing the initial lesion to have been unnoticed, the headache, rise of temperature and general febrile disturbance which sometimes occur about the time of outbreak of the first general exanthem might be mistaken for the onset of some acute specific fever, *e.g.* scarlatina, or small-pox. Syphilitic roseola has been mistaken for

measles, and an early vesicular syphilide for small-pox. In such cases, however, careful attention to the fluctuations of the patient's temperature, the condition of the tongue, throat, and air passages, and the presence of other signs of syphilis, will decide the question in a few days.

The cutaneous eruptions present distinctions which have been described in Chapter IV. and which are sufficient in most cases to separate the syphilitic from the non-syphilitic diseases of the skin.

It not very infrequently happens, however, that for a certain period during the course of syphilis, even at a comparatively early stage, for example, just after the fading of the first general exanthem, there are no obvious marks of the disease. If the patient be seen then for the first time, his syphilis might be overlooked. In such a case the whole body should be carefully examined, especially the genital organs and the mouth and throat, as well as the condition of the lymphatic glands, particularly those of the groin, neck, and elbow.

In later syphilis, when disease of the brain or other viscus is suspected to have a syphilitic origin, the skin and mucous membranes should be searched for scars or gummy deposits; and palpation of the bones of the skull, the clavicles, ulnæ, tibiæ, ribs and sternum should not be forgotten. The eyes may afford important information by the detection of synechiæ, or changes in the choroid and retina. The presence or history of local paralyses, especially of the ocular muscles, is of great importance.

When no positive evidence of syphilis can be obtained, the absence of signs or characters distinctive of other diseases (such as cancer or tubercle) are of considerable value in determining the nature of a doubtful case. A long continuance of weak health in a person of naturally good constitution is also a sign worth attention.

Sometimes, however, no satisfactory light can be thrown on the subject from any of these sources, and in this case the history becomes all-important and should be closely investigated. The patient should be questioned concerning the by-gone occurrence of a venereal sore attended by lumps (not abscess) in the groins and followed by spots on the skin, relapsing soreness of the throat or tongue, loss of hair or inflammation of the eyes: a single attack of iritis is particularly suspicious. Lasting or repeated nocturnal pains in the bones or limbs are also signs of much value. Should this investigation yield no trustworthy result, anti-syphilitic remedies must be perseveringly tried and their effect patiently awaited. During this expectant period, precautions must be taken to avoid the error of attributing to the remedy what may be simply the result of spontaneous subsidence of the morbid action, or the consequence of some other remedy employed as an adjuvant to the specific drug. For example,

a patient suffering from hepatic enlargement or cerebral disease may improve temporarily in general health from the spontaneous cessation of the morbid action which has interfered with the function of his liver or brain. Should this improvement have been contemporary with the administration of specifics, it is very difficult to avoid attributing the change to the action of the drug. Nor must we omit to remind the reader that the want of benefit from the administration of mercury or of iodide of potassium is not conclusive evidence that the affection under consideration is not of syphilitic origin. Certain processes set in motion by that disease—the infiltrating sclerosis for instance—after a time become insensible to the influence of specific remedies.

Artificial Irritation.—The frequent occurrence of greater irritability of accidental lesions of the skin in syphilitic persons than in those free from syphilis suggested to Tarnowsky[1] the possibility of employing artificial irritation for diagnostic purposes. He made with strong sulphuric acid and with potassa fusa small cauterisations on the skin of several syphilitic and non-syphilitic persons. By this process he produced sores which, in the case of the syphilitic persons, developed a hard base and were much slower in healing than the sores produced on the non-syphilitic patients. The distinctions which Tarnowsky observed in these cases he supposed to be constant, and the development of induration in the wounds of syphilitic persons he believed to be a useful test of the presence of syphilis either active or latent. Köbner,[2] Kaposi,[3] Gay,[4] and others have also taken up this question, and have shown, on the one hand, that induration may follow the application of caustic to the skin of non-syphilitic persons; and on the other, that induration is not a constant phenomenon in those who are syphilitic.

The Diagnosis of inherited syphilis has already been sufficiently considered in Chapter XIV.

[1] Tarnowsky: Archiv f. Derm. ü. Syph., 1 and 2 Heft. 1877.
[2] Köbner: Berlin. Klin. Wochenschrift. 1879, Dec. 22.
[3] Kaposi: Viertelj. f. Derm. ü. Syph. 1879, p. 278.
[4] Gay: Ibid., p. 543.

SYPHILIS.

CHAPTER XVII.

PROGNOSIS.

Until lately the opinion was generally entertained that syphilis never subsides without treatment. John Hunter was no doubt greatly responsible for this belief, for he supposed that the longer syphilis was left untreated the more virulent it became. But this view has been long shown to be erroneous. Indeed, contemporaries of Hunter were aware that the poison gets weaker in the infected person with time, until it ceases to be communicable to others. It is now known that the disease may cease at any stage after that of the first general eruption: perhaps even in some cases proceeding no further than to the development of the hard sore and multiple enlargement of neighbouring lymphatic glands.

The following case is that of a medical man who carefully watched himself, besides being frequently inspected by me at short intervals, and of whose health I have notes for five years after contagion. Two erosions of the corona glandis and furrow appeared two days after exposure and healed in eight days. Thirty days after contagion the scars hardened plainly and became eroded. The inguinal lymphatic glands also enlarged typically. The induration of the sores subsided in seven weeks, but the enlargement of the glands continued several months. These symptoms were all that were detected. Mercury was taken assiduously for six months.—B. H.

There is no doubt that in a large number of cases syphilis ceases permanently to be active after the first general eruption of the skin has vanished. Furthermore, in the very large majority, the disease becomes exhausted when two years have elapsed from the time of infection. Diday,[1] in order to gather information concerning the natural course of syphilis, treated ninety-three cases without specifics. In seven of these the course of the disease ended with a single

[1] Diday: Thérapeutique des Maladies Vénériennes. 1876, p. 254.

rash on the skin and slight febrile disturbance. Some of these seven patients were under Diday's observation for periods varying between twenty and twenty-seven years. In fifty-three of the cases there were repeated relapses of affections of the skin and mucous membranes which extended the duration of the disease to ten or eleven months. Twenty-nine patients had a severe course of superficial affections accompanied by periostitis, iritis, &c. The mean duration of the disease in them was twenty months. In four patients the disease rapidly assumed a grave character with early rupia, tubercles, and other lesions usually confined to the tertiary stage. This statistic of Diday's is a valuable index of the habitual course of syphilis. Nevertheless, the malady is so persistent in a small number of persons that it is practically incurable. Even such cases, however, may be benefited by treatment.

The influences on the course of syphilis of climate, exposure, personal habits, age, pregnancy and the source of the poison have already been discussed in Chapter II.

Influence of length of incubation on Prognosis.—Concerning the length of time intervening between the insertion of the virus and the first appearance of its effects at the point of entry, Diday[1] is of opinion that the future course of syphilis is likely to be mild if this period be protracted, and severe if the initial lesion harden quickly after contagion. For our own part, bearing in mind the many exceptions which have come under our observation, we are unable to accept this view. We believe that no reliable indication concerning the future course of the disease can be derived from this source. Mauriac[2] has also recently examined this point and comes to a similar conclusion.

Extensive ulceration of the initial lesion in some cases precedes a severe and prolonged course of syphilis, but the contrary is not infrequent. Bassereau,[3] and following him, Sturgis,[4] have endeavoured to establish a connection between phagedænic ulceration of the initial sore and a severe course of general syphilis. Cases are nevertheless numerous where most obstinately recurring forms of syphilis have been preceded by almost complete absence of ulceration of the initial lesion. Conversely, spreading ulceration is not invariably, perhaps even not usually, followed by a severe course of syphilis.

It is often thought that *much induration of the initial lesion* is a sign of a severe course of syphilis. Babington, Bassereau, and Diday,

[1] Diday : Exposition des nouvelles Doctrines sur la Syphilis. 1858 ; and Thérapeutique des Mal. Vén. 1876.
[2] Mauriac : La France Médicale. 1880, 6 Mars, p. 145.
[3] Bassereau : Affections de la peau Symptomatiques de la Syphilis. Paris, 1852, p 443.
[4] Sturgis : Prognosis of Syphilis. Amer. Journ. Med. Sci. July, 1873.

maintain this view. Cullerier,[1] on the other hand, considers that the severity of the attack of syphilis is by no means in direct relation to the amount of induration. Cock[2] has lately given the results of a long experience of syphilis as regards this point. He is of opinion that the extent and amount of induration vary simply according to the quantity of cellular tissue of the affected part—"the more cellular tissue, the more solid deposit"—consequently that the amount of induration bears no relation to the virulence of the poison or the severity of after-symptoms. Gascoyen[3] also is of opinion that copious induration of the initial lesion is by no means a certain prelude to a severe attack of constitutional disease, but rather the reverse.

I have notes of nine cases of severe protracted syphilis, where I had the opportunity of observing the condition of the initial manifestation. The induration was extensive in six; in two it was moderate, but they were weakly lads of eighteen to twenty. In the last case, the induration was so ill-marked that I waited till the roseola showed itself before I could be sure that syphilis had been contracted. Again, I have notes of two more cases where induration was great, but the subsequent course of the disease mild: in one a lump formed on the prepuce as big as a horse-bean, and in the other, a woman, the induration extended deeply over an area as large as a shilling, on the right labium majus. The male patient usually showed himself twice a-week for six months, never allowing a longer interval than a week between his visits. His syphilis was confined to this copious induration, to enlarged inguinal glands, and to superficial ulceration of the tonsil, with inflammation of the fauces. The woman had sore throat, papular eruption on the shoulders, and some mucous tubercles. The general health of both these persons remained excellent the whole time. They were infected in January and March, 1865, and they remained free from relapses after August and December of the same year until the end of 1879, when they were last seen.—B. H.

Besides, the cases are too numerous to be ignored where severe late affections of syphilis, destructive gummata, paralyses, &c. occur in patients whose early symptoms have been so slight as to be completely overlooked. In such cases it is obvious that the initial induration could not have been great.

The seat of the initial lesion.—If the initial lesion be placed in some important structure, the eyelid for example, considerable local injury and subsequent deformity may result if much ulceration occur; but beyond this the after course of syphilis is not necessarily influenced by the position of the initial lesion. Cock,[4] however, thinks that a fairly trustworthy prognosis may be given regarding the nature and extent of the subsequent affections by observing the position of the primary sore: he holds that sores of the glans and body

[1] Cullerier: Précis Iconographique des Mal. Vén. Paris, 1866, p. 238.
[2] Cock: Guy's Hosp. Rep., vol. xxii. 1877, p. 1.
[3] Gascoyen: Medico-Chirurgical Trans. 1875, p. 16.
[4] Cock: Loc. cit.

of the penis are more often followed by a severe course than are sores of the prepuce. Again, some observers believe that extra-genital primary lesions are followed by a course of syphilis graver than usual; but the evidence is by no means conclusive. It is true that medical men, students, and midwives who contract syphilis on the finger from parturient women, frequently suffer very severely, but this is probably due to a bad state of health from overwork or some other cause rather than to the position of the sore.

Copious multiple enlargement of the lymphatic glands in connection with the initial lesion is often an indication of a severe course, though exceptions to this are not rare. Early enlargement of the lymphatic glands of the body generally, during the period of the exanthems, is much more certainly prognostic of a severe course. This change is usually accompanied by, if not a cause of, considerable anæmia and debility—conditions favourable to the development of grave affections.

From the form and variety of the early eruptions something may be gathered as regards prognosis. The general macular and papular syphilides, especially when not confluent, nor spread very closely over the skin, appear to be less commonly the precursors of tertiary affections of the viscera than the rashes which are ill-marked and limited in their area. Obstinately relapsing squamous eruptions of the skin or tongue are also rarely associated with visceral disease. Such patients usually, apart from the annoyance of their skin disease, enjoy excellent health, even though their syphilitic affections last for thirty or forty years. It would almost seem that when the virus attacks the skin obstinately, it may expend itself there without affecting the internal organs. Taylor[1] considers it almost a rule that the vital organs escape when syphilis attacks the skin with great severity. This dictum is however too absolute.

Scanty development of the early syphilides has been observed to be common in patients who afterwards become afflicted with grave tertiary affections. Lancereaux[2] remarks that of nearly thirty cases of visceral syphilis he had been unable to discover in ten patients the least trace of symptoms intermediate between the initial lesion and the development of the affections of the internal organs. Brouardel[3] and many others have also pointed out that grave syphilitic lesions are frequently met with in those who have either overlooked or paid no heed to the early manifestations of their malady, and who, owing to the insignificant appearance of their early affections, have commonly not sought for treatment. Our own experience completely accords with this.

[1] R. W. Taylor: New York Med. Record. 1875, vol. x., p. 284.
[2] Lancereaux: Loc. cit., p. 396.
[3] Brouardel: Gaz. des Hôp. 1874, April 2, p. 305.

Greenfield,[1] in describing the forms of disease detected in twenty-two post-mortem examinations of syphilitic persons, records that the skin showed no trace of syphilis when the most characteristic and extensive cerebral disease was present. This of course only proved that the skin had not been attacked during life by ulcerating or gummy syphilides. On the other hand, the same observer found that in those cases where very obvious traces of disease of the skin remained, the internal organs were but little affected.

The influence of intercurrent diseases on the course of syphilis.—In syphilis, as in many other diseases, the intercurrence of any acute affection, such as scarlatina, erysipelas, or the vaccinal fever, often causes the symptoms of the original malady to disappear for a time; but they generally return on the subsidence of the acute disorder. Lancereaux[2] and Jullien[3] have collected the writings of earlier authors who touch upon this question. Bassereau[4] points out that the appearance of an acute fever or pneumonia, during the course of syphilis, will retard the development of the syphilitic affections. Lancereaux agrees in this, having himself remarked a similar effect produced by an intercurrent attack of variola. The same observer remarks that Bamberger and Fronmüller have noticed the transformation of small-pox pustules into condylomata.

Again, Lancereaux also records that during the course of cholera and typhoid fever, and Jullien during that of pleurisy and pneumonia, syphilitic affections disappear rapidly. Mauriac[5] has written a long essay concerning the effect of erysipelas in causing the disappearance of syphilitic eruptions. Deahna[6] has published a case of similar kind; and Minelli[7] observed, among Gamberini's patients, a woman with a tubercular syphilide of the face, which rapidly disappeared after an attack of erysipelas. This beneficial influence, if it may be so called, of erysipelas on syphilitic affections is only seen in the milder or more chronic forms, especially in papular or tubercular syphilides, and even in these it does not prevent a fresh outbreak of the syphilide afterwards. If erysipelas attack a cachectic patient with a rapidly spreading skin disease a fatal result is not uncommon. In connection with this may be mentioned the curious fact that Woakes[8] noticed during an epidemic of scarlatina of nine months' duration, that in all the fatal cases (five) which occurred in his practice, the children were the subjects of

[1] Greenfield: Path. Trans. 1877, p. 257.
[2] Lancereaux: Traité de la Syphilis, 2ème édition, 1873, p. 447.
[3] Jullien: Maladies Vénériennes. 1879, p. 691.
[4] Bassereaux: Loc. cit., p. 177.
[5] Mauriac: De l'effet curative de l'érysipèle dans la Syphilis. Gaz. des Hôp. 1873.
[6] Deahna: Vierteljahresschrift für Dermat. u. Syph. 1876, p. 57.
[7] Minelli: Giorn. Ital. delle Mal. Ven. e della Pelle. 1880, Fasic. iii., p. 141.
[8] Woakes: Brit. Med. Jour. Oct. 5, 1872.

inherited syphilis. Jullien records a case where, on the outbreak of acute rheumatism, the cicatrisation of tertiary ulcers took place in seven days; but the ulcerating syphilide reappeared as soon as the acute rheumatism had ended. We have seen copious roseola disappear during acute rheumatism to return when the fever subsided. Diday observed an obstinate palmar psoriasis and mucous patches of the tongue disappear without relapse after a general attack of boils. Indeed, treatment of syphilis by the now obsolete practice of 'syphilisation,' *i.e.*, the persistent inoculation of venereal pus on the skin, is founded on the pathological law that chronic diseases are kept in abeyance during the course of acute ones. The production of irritation by an ointment of tartar emetic as a means of curing syphilis is also founded on the same law.

Certain diatheses have power over the course of syphilis: for example, tuberculosis, scrofula, and gout. Paget[1] remarks that the difference in the constitution of the patient has much to do with the course pursued by syphilis in different persons. Lancereaux,[2] while admitting the influence of the tuberculous, scrofulous, and gouty diatheses on the course of syphilis, contends that they have influence only when in activity—that syphilis in a man of gouty diathesis is only modified when gout is active in his system, and so on. Paget believes that in course of time, as the activity of the syphilitic poison wanes, the affections assume more and more the characters of the patient's inherent diathesis, so that ultimately the syphilis and the diathetic disease may become almost indistinguishably intermingled.

In tuberculous subjects syphilis is prone to take a severe course; anæmia is often marked, and the eruptions on the skin often suppurate. It is believed by some that mercury is ill-borne by tuberculous patients. This does not accord with our experience. On the contrary, mercury is as efficacious in controlling syphilis in such patients as in others and, if properly administered, is as little hurtful to them as to others.

In scrofulous persons also syphilis is often very obstinate; ulcerating syphilides are prone to develope, and determine, by impairing the patient's general health, the development of ordinary forms of scrofulous disease.

Gout and rheumatism affect the course of syphilis, and are themselves affected by that disorder. Thus, the tendency to dry desquamation of the skin in the gouty diathesis appears to influence the form assumed by the syphilitic skin eruptions, which in gouty patients are almost exclusively of the dry scaling, or chapping and peeling

[1] Sir James Paget: Clinical Lectures and Essays. 2nd edition, 1879, p. 360.
[2] Lancereaux: Loc. cit., p. 448.

variety. In gout, gummy syphilides are rare, and visceral lesions not common.

Bright's disease has great influence over syphilis. When persons whose kidneys are damaged contract syphilis, they are likely to have that disorder in a most malignant form. Visceral lesions may develope early, and cause fatal destruction of some vital organ.

Alcoholism affects the course of syphilis in two ways. First, by a directly deleterious influence on the patient's system. Syphilis is apt to pursue a malignant course in the subjects of chronic alcoholism. Tertiary affections occur early and repeatedly both on the surface of the body and in the viscera. Secondly, by causing continual gastric disturbance it prevents the proper action of anti-syphilitic remedies. Even the daily imbibition by syphilitic patients of more than the most limited quantity of alcohol interferes greatly with, and sometimes altogether prevents, the beneficial action of specific medicines.

The consequences of wounds or accidental injuries to syphilitic persons are variously stated. Swediaur[1] and many others after him have attributed to syphilis the power of rendering the bones morbidly fragile. There is great doubt if syphilis has such influence; or even that still more frequently attributed to it, of preventing union of bones broken during the activity of its poison. Delpech, Verneuil[2] and others have insisted on the slow reparative power of the tissues in syphilitic persons. This is so far true, that syphilis in certain persons favours exhaustion of strength and vital energy; but this condition, whether due to syphilis or to other causes, equally retards plastic growth and repair.

Bénicy[3] sums up very tersely in the following conclusions what is known concerning the influence of syphilis on wounds:—During the primary stage of syphilis there is no perceptible influence. So also in the secondary stage no change is usually found; yet simple excoriations may assume the indurated character of the primary initial lesion. Secondary syphilis has no bad effect on fractures. In the latent stage of syphilis an accidental wound may assume the characters of a syphilitic lesion. In the tertiary stage syphilis may be roused into activity by some local lesion. During the exhaustion which often attends tertiary syphilis it appears probable that the bones are more brittle, and that callus is less easily produced than in healthy persons.

The influence of specific treatment on syphilis is undoubted, both

[1] Swediaur: Traité des Mal. Syphilitiques. 1801, p. 183.
[2] Verneuil: Archives Générales de Médecine. 1871, t. ii., p. 407.
[3] Bénicy: Syphilis et Traumatisme. Thèse de Paris. 1879; and Virchow und Hirsch, Jahresbericht. 1880, Bd. ii., p. 525.

in shortening the course of the disease, and in mitigating the severity of its manifestations. With the object of gaining evidence on these points, Jullien[1] collected 218 cases of tertiary syphilis in which the treatment had been noted. He found that in forty-seven patients mercury had been administered from the first appearance of the initial sore; in fifty-nine no mercury had been employed during the whole course of the disease; while in 112 mercury had been withheld until the secondary period was reached. At first glance it would seem as if those patients who began to take mercury in the secondary stage were more likely to develope tertiary affections than those who took none at all, did we not know that many other conditions affect their production. Again, the particulars of these cases were obtained from a large number of observers, French, English, Italian, and so on; and the details furnished in the histories are insufficient to show how far or how long the patients were really under the influence of mercury. An amount and a duration of mercurialisation held sufficient by one observer, would be rejected as useless by another; and hence we cannot accept this statistic as doing more than helping towards a solution of the problem concerning the influence of treatment over the prognosis of syphilis. Far more weighty is the general experience that tertiary disease is most frequent in those whose early symptoms have been so slight as to have been neglected by the patient and thus escaped treatment. It may be very confidently laid down that the prognosis, in cases of syphilis which have been systematically treated with mercury from an early period, is far more favourable than in those where the disease has been left to itself, or treated with specifics for a few weeks or months only.

That syphilis is curable is certain, from the many undoubted instances on record of patients having contracted the disease a second, or even a third time. Unfortunately, however, there is no sign which enables us to say with certainty when the disease is at an end. A long period of freedom from symptoms may generally be relied on, but is not absolutely trustworthy; for syphilis occasionally relapses after many years of quiescence.

There are those, few in number it is true, who cannot bear the action of specific remedies. If subjected to the influence of mercury or the iodides, they quickly become prostrate and their syphilitic affections advance with greater rapidity than if these remedies are withheld. Such persons, if severely affected, rarely survive their disease. In two or three years some acute intercurrent visceral affection usually destroys life.

[1] Jullien: Recherches statistiques sur l'étiologie de la syph. tertiaire. 1874.

The effects of syphilis on the duration of life.—So far as the calculations of actuaries may be trusted, syphilis shortens the duration of life among all persons infected in so small a degree that it may be discarded in roughly estimating for assurance, the value of the life of a man who has had syphilis in the ordinary cutaneous and superficial forms only, and has undergone treatment for it. But in the smaller number of the affected, namely, those who have internal syphilis, *e.g.*, of the brain, spinal cord, liver, lungs, kidneys, or spleen, the duration of life is greatly shortened. Moxon,[1] for example, in fifty-six autopsies on persons who had died of visceral syphilis, found that the average age at which death occurred was only thirty-seven years. It is unusual for such persons to live as many as ten years after the development of their visceral disease. By careful treatment life may be prolonged and the lesion perhaps be cured; but the diathesis is often not wholly subdued. The viscus first affected is attacked anew, or some other organ equally essential to life becomes implicated, and finally the patient dies, either worn out and exhausted, or he is carried off by some intercurrent affection, such as phthisis or Bright's disease.

As a general conclusion, however, it may be stated that, although we cannot assure a patient that he is cured beyond possibility of relapse, experience shows that if a proper and sufficiently prolonged course of treatment have been carried out from an early period, the patient may expect to go through life with scarcely more appreciable risk than one who has never had the disease.

[1] Moxon : Path. Trans. 1876, p. 403.

SYPHILIS.

CHAPTER XVIII.

PROPHYLAXIS.

MEASURES calculated to prevent the spread of disease may be divided into those applicable to the community in general,—and those applicable to the family or to the individual alone.

Public Preventive treatment.—The first of the above divisions, that which concerns the public health, comprises accommodation for treatment of the infected, and provision of restrictions against the spread of disease. There is fear in the minds of many persons lest it be an unwarrantable interference with the liberty of the subject to require those affected with contagious disorders to undergo seclusion while they are liable to communicate their malady to others. This objection has already been overcome in the case of small-pox, and there is no reason why contagious venereal diseases should not bring upon their sufferers the same disability as does that disease. Such penalties in the interest of society have been for centuries enforced with more or less stringency in various countries; nor, in the middle ages, were they altogether unknown in England and Scotland. Continental nations provide accommodation for the reception and treatment of venereal patients in hospitals supported by public taxation. In this country, while every pauper can claim assistance for disabling sickness, in whatever way that sickness may have originated, the dispensers of Poor Law relief not only offer no inducement to those suffering from venereal disease to enter into hospital while they are dangerous to themselves and others, but even, with few exceptions, neglect to put in force the Act passed in 1867 to amend the authority of the Poor Law Board, which authorises all boards of guardians of the poor to detain any inmate of their workhouses affected with contagious disease, so long as he is liable to communicate his disease to others. It is most important for the limitation of venereal disease that these and similar powers should be freely exercised

in order to seclude, while they are in a contagious condition, all who can be legally restrained. For classes where compulsory detention is not practicable, opportunity and increased facilities for the gratuitous treatment of venereal disease are needed; but the detestation in which these diseases are generally held must always reduce to a very insufficient amount the funds supplied by private charity for the treatment of such patients. Hence it is the more necessary that functionaries charged with the care of the public health and of the sick poor should supply in the poor law dispensaries sufficient means for the treatment of the venereal sick. At present, by neglecting to provide for the regular treatment of venereal disease, the State encourages quacks and ignorant charlatans whose sole object is to empty the pocket of the patient, without regard to the treatment of his disease or the prevention of its diffusion.

Without encroaching unduly on the liberty of the subject, preventive measures may be enforced among certain classes of persons who, either by the peculiar conditions of their service, or by voluntarily pursuing an occupation dangerous to society, are specially liable to be distributors of contagion. In the former of these classes we include soldiers, and sailors of the Royal Navy and mercantile marine. In the latter we include vagrants, and most particularly prostitutes.

Soldiers and sailors, by the terms of their service, must be mainly celibate, and consequently are particularly prone to contract and spread venereal disease. As their maintenance in health is a part of the contract between them and their employers, it appears just that within reasonable limits, soldiers, sailors, and merchant seamen should be subjected to personal examination at stated periods, and to hospital detention when found to be infected. That this can be advantageously done is shown by the success of such regulations in all armies and navies.

In this country much diminution of disease has ensued from the enforcement of measures by which, in certain military districts and naval ports, the known prostitutes are subjected to periodical medical examination, and hospital detention when diseased.

The Contagious Diseases Acts.—Parliament passed the first measure of this kind in 1864. This Act, purely permissive in its regulations, was found so inefficient that it was replaced by another passed in 1866. This second Act was supplemented by that of 1869. The Act of 1866 included in its operation nine places in England and three in Ireland, viz:—Aldershot, Chatham, Colchester, Plymouth and Devonport, Portsmouth, Sheerness, Shorncliffe, Windsor, Woolwich, the Curragh, Cork, and Queenstown. By the Act of 1869 Canterbury, Dover, Gravesend, Maidstone, Southampton, and Winchester were added to the list. By these Acts, known as the

"Contagious Diseases Acts," any woman whom the police can prove to the satisfaction of a magistrate to be a common prostitute, may be sent by the magistrate to a certified hospital for examination, and, if diseased, for detention. The magistrate has power also to order the woman to submit to periodical medical examination so long as she continues to act as a common prostitute within the limits of the district under the operation of the Acts. By a clause of the Acts, the woman may, if she think fit, subject herself voluntarily to periodical examination without the magistrate's interference, though in making this subjection she renders herself liable to detention when diseased, and to punishment if she fail in regular attendance for examination. There is also provision for the moral and religious instruction of the woman while in hospital; and, on her discharge thence, for facilitating her admission to an asylum or her return to her friends when the latter reside beyond the districts in which the Acts are in force.

In these districts, where large military or naval forces are maintained, the effect in lessening the loss of service from venereal disease, though imperfect from the very limited areas over which the regulations operate, is nevertheless sufficiently marked to prove their usefulness. Much contention has taken place concerning the value of the results gained by the Acts; but into this controversy it is needless to enter in this work.

The Army.—In the following statement taken from the army medical report,[1] the prevalence of venereal sores and gonorrhœa at the twenty-eight largest military stations in the United Kingdom is contrasted. Owing to the long period of activity of secondary syphilis, often much longer than the stay of any particular corps in one district, no comparison is made between the cases of secondary syphilis treated in hospital in the protected and in the non-protected districts.[2] Otherwise a case of syphilis might be charged to one district when it had been contracted in another distant one; for, every relapse of his disease that sends the soldier to hospital is entered as a separate case of syphilis. The stations are equally divided into two groups, A and B. In the former, A, the Acts have been gradually introduced into full operation: in the latter, B, the Acts have never been applied. In both groups the sanitary regulations of the troops have been the same, the only difference being the enforcement in Group A of such regulations as concern the prostitutes residing in those districts. Though the several

[1] Army Medical Reports, for 1878, published in 1880.

[2] Since the above was written, Inspector General Lawson, in his evidence before the Select Committee of the House of Commons (May 2, 1881), has shown that the ratio of admissions for *secondary* syphilis in Group A, has diminished by at least one-half since the Acts came into operation. In Group B, on the other hand, there has been no diminution.

Acts came into partial operation at some of the districts of Group A as soon as they were passed, all their provisions were not generally enforced until 1870.[1] Consequently the ratios of admissions to hospital for venereal sores and gonorrhœa per 1000 of strength of the forces have been selected, for purposes of comparison, from three periods.

First Period of Four Years, 1860–63 : *No Preventive Measures in Force at any Station.*

Per 1000 of strength.	Group A.	Group B.
Primary sores	130	116
Gonorrhœa	135	129

(London and Windsor are excluded from the returns for Stations B ; if they were included, the figures would be, primary sores, 121 ; gonorrhœa, 112.)

Second Period of Four Years, 1870–73 : *The Acts in Partial force at the Fourteen Stations of Group* A.

Per 1000 of strength.	Group A.	Group B.
Primary sores	52	108
Gonorrhœa	100	101

Third Period of Five Years, 1874–78 : *Acts thoroughly carried out at the Fourteen Stations of Group* A.

Per 1000 of strength.	Group A.	Group B.
Primary sores	37	94
Gonorrhœa	67	75

From October, 1873, to the middle of 1878, the Secretary for War ordered that the soldier's pay should be stopped while he was in hospital for primary venereal disease and gonorrhœa. This order applied to all stations of both A and B. Hence some of the diminution in the returns is due to concealment of disease. But this cause was equally at work both at protected and at non-protected stations. The Army Reserves were called up in 1878, and there was an immediate increase of venereal disease at all the stations. But the beneficial effects of the Acts were shown most satisfactorily ; for, whereas in the towns in Group A the increase of primary venereal sores in 1878 as compared with 1877 was from 35 to 40, or only 5 per 1000, in Group B the increase was from 91 to 131, or 40 per 1000.

Thus in 1878, a year of high rate for the reason given, at the stations of Group A (55,813 men) the admissions per 1000 of strength were 40. At the stations of Group B (20,749 men), in 1878, the ratio was 131. But much higher than this rate was the entry at certain large towns of Group B. In London, it was 250, in Manchester 205, and in Dublin 154 per 1000 of strength. The highest rates at stations where the Acts are in force were in 1878, at the Curragh, 54 ; at Aldershot, 53 ; and at Chatham, 49. This striking difference between the prevalence of primary venereal sores at stations under the Acts and at those not under the Acts is also shown by the difference in loss of the men's services from this cause. At the stations of Group A, the number of men always in hospital with this disease was 3·47 per 1000 : but at the stations of Group B, 7·99 per 1000, that is, more than double.

[1] Report of the Royal Commission of 1871 on the Contagious Diseases Acts.

The effect of the operation of the Acts upon the health of the Coldstream regiment of Guards is also very remarkable. This regiment is stationed alternately at London, a town not under the Acts, and at Windsor, a town where the Acts are in force, and the unmarried men in this corps are medically examined as a rule once a fortnight, but when disease is prevalent, once a week. Mr. Arthur B. R. Myers, surgeon in that regiment for twenty years, described to the Select Committee of the House of Commons in 1879,[1] the change which had taken place in the regiment while quartered at Windsor since the introduction of the Acts there. Mr. Myers stated that twenty years ago, *i.e.* in 1859, it used to be calculated that between one-third and one-half of the men were always suffering from venereal disease; though of course the number actually incapable of duty from that cause was less. Mr. Myers' returns showed the entries for venereal sore from 1865 to 1878, during the periods his battalion was stationed at Windsor, where the Acts, though set in operation in 1868, did not get into full working order till 1871. The several periods of stay at Windsor were of nearly equal length: namely, from twenty to twenty-five weeks respectively. In 1865, 707 men sent 49 to hospital. In 1868, 608 men sent 64 to hospital. In 1871, 700 men sent 33 to hospital. In 1874, 656 men sent 15 to hospital, and of these 15 men 12 had contracted their disease away from Windsor. In this year also, for seven weeks, there was no case of primary venereal sore in hospital. In 1876–7 the number of admissions was eleven. The battalion on this occasion arrived at Windsor direct from Aldershot, a station under the operation of the Contagious Diseases Acts. In 1878, the battalion came to Windsor direct from London; the admissions during this period reached 25, but in 15 of the cases the disease had been contracted before the soldiers reached Windsor.

In the Royal Navy, the influence of the Contagious Diseases Acts is equally striking. For appreciation of their effect, the ratios for primary venereal sore and syphilis per thousand of strength have been arranged in four groups as follows.[2]

	Ports under Acts.		Ports not under Acts.	
First Group. No Acts in force, 1860—63.	75·02		70·05	
Second Group. Tentative Act of 1864 in force, 1864—65	79·12		100·00	
Third Group. Acts of 1866 and 1869 in force, 1866—70	47·19	Primary, 34·74; Secondary, 12·47	84·74	Primary, 59·14. Secondary, 25·60.
Fourth Group. Acts of 1866 and 1869 in force, 1871—79	39·89	Primary, 28·79; Secondary, 11·10	94·08	Primary, 72·27. Secondary, 21·80.

[1] Report of Committee of House of Commons on Contagious Diseases Acts, 1879, sitting of July 30th, 1879.

[2] Statistical Report of the Health of the Navy for 1879. 1880, Appendix, p. 92.

The returns for gonorrhœa do not show any decrease: on the contrary, an apparent increase. This increase is explained in the official report by the statement that in the navy only severe cases of gonorrhœa were placed on the sick-list before the passing of the Contagious Diseases Acts. Since that date, however, the medical officers have more closely registered cases of venereal disease, and thus a large number of cases are now recorded which formerly would not have appeared in the returns.

This table shows plainly that before the introduction of preventive measures the amount of invaliding from venereal diseases was increasing at all the Home Ports, whereas as soon as the Acts came into effective operation the ratios sank steadily at the protected ports, being now only one half of the former amount. In the ports still unprotected, the ratios have sunk but slightly, and that in an uncertain manner; for the latest returns are higher than those of eight years ago, and much higher than they were in 1863.

The Women.—The effect of sanitary restrictions upon the health of the women in the towns under the Acts is not less marked. In the official report on the operation of the Contagious Diseases Acts for 1878[1] it is stated that 1941 women were registered during that year. Of this number, 740, or 40 per cent. were found to be diseased on their first examination; while of 1711 women who were previously on the register and subject to regular fortnightly examination, only 110, or 6 per cent. were found to be diseased. The influence of these Acts in diminishing prostitution both by preventing the fall of the inexperienced or viciously inclined, and by assisting to an honourable mode of life those who have already sunk into prostitution, is even more remarkable than their effects on the physical health of the persons subject to their provisions. The results are fully set forth in the Report of the Royal Commission of 1871, and in the Annual Reports of the Assistant Commissioner of the Metropolitan Police.

Effect on the Civil Population.—While the beneficial effects are of course chiefly shown among the soldiers, sailors, and prostitutes dwelling within the areas specified in the Acts, a favourable influence on the general civil population of the same districts is sufficiently obvious to be easily discerned in the Reports of the Registrar-General. The following statistics are drawn from an able article published in the British Medical Journal.[2] The first relates to the mortality from syphilis of the districts brought under the Acts before and since the passing of the Acts in the protected districts and in the rest of England and Wales. From these comparisons,

[1] Annual Report (for 1878) of the Assistant Commissioner of Metropolitan Police, relating to the Contagious Diseases Acts, p. 3.

[2] British Medical Journal. 1876, July 8, vol. ii., p 50.

Woolwich is excluded on account of its proximity to London, whereby diseased men and women might easily find their way into Metropolitan hospitals and thus cause an apparent diminution of fatal cases of syphilis in the Woolwich district. The civil, military, and naval population of these districts in the periods in question was about half a million souls. During the five years 1861—5, immediately preceding the first partial operation of the Act of 1866, the deaths ascribed to syphilis were 354; and in the five years 1870—4, when the Acts were in better operation, 303. Measured by the proportion to population, the annual death-rate was equal to 140·7 per million persons living in the first five years, and in the second quinquenniad, equal to 108·4 per million of persons living. That is, the death-rate from syphilis in the protected districts was 21 per cent. lower in the second than in the first quinquenniad. To appreciate this decline properly, the annual death-rate from this disease in the rest of England and Wales must be calculated. In the earlier period of five years, this ratio was 66·1 per million of persons living in those parts of England and Wales not included in the operation of the Acts; while in the second period, 1870—4, instead of declining, it had risen to 79·7 per million. That is to say, it had *increased* over its earlier rate by 20 per cent., or by nearly as much as in the protected districts it had *diminished*. But in another way the contrast is perhaps more marked. During the five years 1861—5, that is before the Act of 1866 was passed—the death-rate from syphilis in the eleven protected stations was more than double the average rate in the rest of England and Wales, being in the proportion of 213 to 100, showing an excess of 113 per cent. in the eleven stations. In the second five years after the Act had come into full operation, the excess over that for the rest of England and Wales had declined from 113 per cent. to 36 per cent.

Probably the foregoing statistics only very roughly indicate the effect of the Contagious Diseases Acts on the spread of syphilis; for in certain of the largest stations taken separately, the diminution varies greatly. But the fact that in the large garrison and dockyard towns, formerly the hot-beds of syphilis, the disease is making a marked decrease now that they are subject to the Contagious Diseases Acts, while in the rest of England and Wales an equally marked increase has taken place, makes it difficult to comprehend that any other cause has been efficient. The mode of registration has been the same, and the spread of knowledge in the medical profession concerning what is syphilitic disease and what is not, has been general, and not limited to any part of England.

Further, in every disease, to which syphilis is no exception, there is a constant relation between the number of persons affected

and the smaller number who die of it; hence, if the ratio of persons who die of syphilis has decreased by one fifth, it is fair to assume that the number of those infected in the eleven districts has diminished by one fifth of its former ratio. Conversely, the increase in the death-rate for the rest of England and Wales is indicative of an increase in the prevalence of syphilis by one fifth.

Vaccination.—The transmission of syphilis by employing syphilitic children as vaccinifers, though an extremely rare occurrence, does occasionally take place. For its prevention it is requisite that the vaccinator should be in all cases, as is the law in this country, a properly qualified medical practitioner; that vaccine lymph should be taken solely from children whose bodily conditions and family history give sufficient guarantees of the absence of syphilis; while even with them precaution should be taken to charge the vaccinating point only with the lymph of the vesicle, and to avoid admixture of the patient's blood. No scarifier or lancet should be used a second time until it has been thoroughly cleaned. Through neglect of this precaution one of the nurses of the lying-in department of La Charité Hospital at Paris, was inoculated with syphilis through being re-vaccinated with a lancet that had been employed for a similar purpose on a syphilitic child without being cleaned.[1]

Again, whenever there is doubt respecting the source of the vaccine, heifer's vaccine lymph should be used. Indeed, it would be good policy, to allay the exaggerated dread of contamination with syphilis from which some parents suffer, for public authorities to maintain a stock of heifer vaccine lymph, to be employed at the option of the parent. But even if this extreme precaution be taken, want of ordinary care may allow syphilitic contagion to creep in: for example, in the case of the nurse just narrated, although heifer's lymph was used for the re-vaccination, a foul lancet was employed, and syphilis was thus imparted.

During the performance of the Jewish rite of *circumcision*, it was formerly universal for the rabbi to suck the wound, in order to remove the taint which the contact of iron or steel was supposed to bring to any wound. In modern times this belief has been abandoned, and certain communities of Jews have discarded the practice of sucking the wounded prepuce. This change has been made the more readily because from time to time, suspicion has arisen that syphilis might reach the child from the lips of the operator. We have not yet discovered an undoubted instance of such a disaster, though it is not an impossible one.

By some surgeons, circumcision has been recommended as a pro-

[1] Ory: Des Syphilides Malignes Précoces. 1876, p. 27.

phylactic against syphilitic infection, by removing the part likely to be attacked by posthitis through neglect of cleanliness, and thereby eroded and rendered ready for the reception of contagion. This practice appears to be scarcely justifiable; though some statistics collected many years ago by Hutchinson[1] tend to show that Jews are less liable than Christians to syphilis. Of fifty-eight Jews with venereal disease, eleven had syphilis and forty-seven gonorrhœa; while of 272 uncircumcised persons 155 had syphilis, and 107 gonorrhœa. We have ourselves remarked at the Lock Hospital that among Jews the site of the sore is more frequently the sheath than the furrow or the glans penis.

The artizans in certain trades, more often abroad than in this country, pass in their work, implements or material from mouth to mouth and thus not infrequently inoculate each other with syphilis. This mode of propagation has been described in Chapter II.

Here also should be mentioned the necessity for extreme care in the complete purification of dentists' and surgeons' instruments; this should be practised at all times, but most especially after being used on syphilitic patients.

The Prevention of Contagion among Individuals.—Continental surgeons recommend certain precautions for adoption before the risk of contagion is incurred. They are at the best but untrustworthy protectors, and far inferior to the scrupulous observance of cleanliness which should be daily practised by all persons of both sexes. This is the best means for preserving the delicate skin and mucous membrane of the genital organs from abrasions, and for keeping the door shut against contagion. Soap and water after sexual intercourse is as effective as any other lotion in removing irritable secretions before absorption has taken place. In the chapter on Contagion it was shown that the application of caustic to abraded surfaces after exposure to contagion is useless to prevent infection. On the other hand, special precautions afford a false and mischievous security by removing the dread of contagion from those yielding to their passions, at a time when considerations of a restraining character are especially necessary.

Marriage.—Unfortunately, the infection of women soon after their marriage is an occurrence of considerable frequency. Fournier[2] states that of 572 syphilitic women among his private patients eighty-one were young women infected in the first few months of married life. The question of prevention of the spread of syphilis in connection with marriage may be divided into two parts: that which concerns the proper treatment of the disease before marriage

[1] Hutchinson: Med. Times and Gaz. 1855, Dec. 1.
[2] Fournier: Syphilis et Mariage. 1880, p. 20.

has taken place, and the measures which must be taken when marriage has actually occurred.

When marriage is contemplated, it is an obvious duty to prevent either the infection of a healthy spouse or the procreation of syphilitic children, and this danger must always be pointed out to persons liable to incur it. It is difficult to impress on many people the length of time that should in all cases elapse after the cessation of symptoms before marriage is permissible; while others on the contrary, are nervously afraid lest they be in a contagious condition many years after all signs of the disease have departed.

Under no circumstances should a person with obvious signs of syphilitic disease marry, however long a time has elapsed since his infection. For though communication is rare when several years (four or five) have elapsed, it may still take place after as many as ten or even more years, even when the form of the disease is of the character commonly called tertiary. This being premised, it may be accepted as a general rule, that the activity of syphilis usually continues for two years before the poison subsides into quiescence. But the virus also not infrequently regains its activity before it becomes finally inert; hence after the last symptoms have disappeared there should be an interval of twelve months free from symptoms and free from treatment before marriage takes place. Under any circumstances, the shortest period between infection and marriage should be three years. The liability to transmit the disease may, as is shown by observation, cease earlier than this, but such early termination is rare. On the other hand, power of transmission may endure obstinately with certain forms of syphilis,—the frequently relapsing dry eruptions for example; and sometimes even when there are no perceptible manifestations in the parent.

Syphilitic visceral affections, especially those of the brain and cord, are grave objections to marriage, both on account of their liability to recur, and also on account of the probability of their causing permanent disablement or death. Consequently, though the patient may not communicate his disorder, his precarious tenure of life does not justify his contracting marriage.

Should the treatment of the disease during its early periods not have been systematic and prolonged, it will be prudent to subject the candidate for marriage to an assiduous course of mercurial treatment for at least three months before he enters on his twelve months' period of observation, during which period it is sometimes useful for the patient to go through a course of bathing in warm sulphur springs. For, if the poison retain any activity and especially if it be about to regain activity, the stimulus of baths to the skin sometimes hastens the development of symptoms. Still, too

much reliance must not be placed on this test. Physicians who practise at the sulphur springs of the Alps and Pyrenees do not claim for their waters more than a very limited power of this kind. Fournier[1] has collected some interesting examples of persons who subjected themselves for six and seven seasons to the waters of Luchon without any sign of syphilis being evoked; yet years afterwards syphilitic affections developed in them.

The following case lately came under my observation. A. B., 23, contracted syphilis in March, 1873; he consulted me in April, with hard initial sore, and in June with roseola and erosions of the fauces. In August, though the symptoms had departed under mercurial treatment, being impatient at the prospect of several months' further subjection to the same treatment, he was persuaded by friends to go to Aix-la-Chapelle for a course of bathing and inunction. This he carried out thoroughly for six weeks in August and September, 1873. In October I saw him again, triumphant in his complete cure. During the next four years he remained free from syphilitic symptoms, and in excellent health. In 1877, he consulted me respecting the propriety of his marrying, and received a favourable opinion. But being most anxious to avoid all risk of giving disease to others, he went to Aix-les-Bains in September for a course of the sulphur springs and bathing. He remained there four weeks, and produced a crop of boils, but no syphilitic symptoms. In 1878, he married in apparently excellent health. In 1879, he had a leproid eruption of somewhat large tubercles on the right scapular region, for which he consulted me. At his second visit he brought his wife, who complained of sore throat. She had mucous patches of the velum and tonsils and papulo-crustaceous eruption of the scalp. She made no complaint of any affection of the genitals, and denied the existence of spots on other parts of the body. Both husband and wife were treated energetically with mercury for four months, when his wife was delivered of a child, born at term, but dying a few hours after birth. Treatment was resumed on the recovery of the wife from her confinement for six more months with complete dissipation of all her symptoms. Owing to the injunctions laid on the husband, she has not again become pregnant.—B. H.

Even when a patient is considered to be in a fit condition to marry, he ought to watch throughout his life for any sign of renewed activity of syphilis, and, if such appear, he should at once resort to medical aid.

Should the husband discover a relapse of the disease in himself before his wife becomes pregnant, he must go through a complete course of treatment and, at any sacrifice, prevent his wife from becoming pregnant. But if he only perceive his own condition after his wife has become pregnant, then he should at once undergo treatment himself and cease all intimacy with his wife. The prophylaxy for the wife is not so obvious. In the face of the well-known fact that syphilis is by no means invariably transmitted from men in whom the disease is active, to their wives and children, it is

[1] Fournier: Syphilis et Mariage. 1880, p. 146.

scarcely justifiable to subject to mercurial treatment a woman apparently healthy, and who may both in her own person and in that of her child have escaped contagion. On the other hand, she may have been infected and be one of those examples, so frequent in syphilitic women, where the disease manifests itself by such trivial signs as to escape observation, and only shows itself unmistakably at a later period, when the condition or death of the child has revealed the father's disastrous influence. As a general rule, it is most prudent to await positive evidence of disease before applying specific treatment, though special conditions, such as the anxiety or earnest wish of the parents to avoid risk as far as possible, may render the administration of a mercurial course to the apparently healthy mother during her pregnancy expedient.

On the other hand, should there be fair presumption of latent syphilis in the mother, however apparently good her health may be, anti-syphilitic treatment should never be omitted. Indications of latent syphilis are, 1st, the previous birth of syphilitic children; 2nd, the occurrence of repeated miscarriages; 3rd, the history of a brief or imperfect treatment of syphilis in a mother infected years previously.

Prevention of the spread of Syphilis by infants and wet-nurses.—In France, where mothers in the upper classes more habitually resort to wet-nurses for the alimentation of their children than is the practice in this country, infection of the nurse by its foster-child is not an uncommon occurrence.[1] Though more rare in this country, every family physician when advising the surrender of a child to a wet-nurse, should make careful inquiry into the health of the parents and examine particularly the condition of the child itself. Under no circumstances should a child suffering from syphilis be intrusted to a healthy wet-nurse; for she may become infected herself and transmit syphilis again to her own family. Unless, therefore, there be satisfactory evidence that the nurse herself has suffered from syphilis, the physician should never allow a syphilitic child to be suckled by any one except its own mother. Again, if a healthy woman has already begun to suckle a diseased child when the medical attendant is called in, he must insist on the immediate discontinuance of suckling, should the nurse not already show signs of syphilis.

When the advice comes too late, and the child has already infected the nurse, the medical attendant should advise that the infected nurse be retained, told of the nature of her disease and treated steadily for it. The wet-nurse must also be informed that she is

[1] See Fournier: Nourrices et Nourrissons syph Paris, 1878.

liable to spread disease not only among her own family but also to others with whom she may come in contact.

If a nurse who has been suckling a syphilitic child show no signs of the disease at the time of her separation from her nursling, she should be kept under careful observation for some weeks, and not allowed to give suck to other children until the extreme limit of the period necessary for the incubation of syphilis has gone by.

Dron [1] gives an account of seventeen cases of infection by suckling in which the initial lesion on the breast did not appear for a period varying from three days to a month after the death of the child who had infected the nurse, or after cessation of lactation. In two of these cases the diseased wet-nurses afterwards infected healthy children. Fournier [2] also observed the case of a nurse who suckled a syphilitic child until it died, and in whose person the initial lesion did not appear until fifteen days after the child's death.

The prevention of the introduction of syphilis into a family by means of a wet-nurse is only to be effected by careful examination both of herself and of her child. The latter should be at least five or six weeks old in order that, if syphilis have been inherited, it shall have had time to show itself. In the chapter on Contagion instances are recorded of the surprising ways in which syphilis may spread through families, and no precaution should be omitted to prevent its introduction. Dron [3] relates another striking example. A syphilitic child infected its wet-nurse. This wet-nurse, to unload the breast, took three other infants to suckle; all three children thus contracted syphilis and infected their mothers, who in their turn infected also their husbands.

[1] Dron: Annales de Dermatologie et de Syphiligraphie. 1869—70.
[2] Fournier: Syphilis chez la Femme. Paris, 1873, p. 26.
[3] Dron: Mode particulier de transmission de la syphilis au nourrisson par la nourrice, &c. Lyon. 1870. Quoted also by Fournier: Syphilis et Mariage. 1880, p. 213.

SYPHILIS.

CHAPTER XIX.

TREATMENT.

Historical Sketch.

At the end of the fifteenth century, when syphilis was first recognised as a distinct disease, it was treated mainly by blood-letting, starving, purging, and sweating in hot chambers, to which a host of nostrums, often of a most disgusting kind, were added. Mercurial ointment was employed even in the fifteenth century to cure syphilis. But it was used with so little discrimination, and caused such violent salivation, that it soon fell into disfavour. As narrated in the Aphrodisiacus,[1] some physicians continued to use it nevertheless, and endeavoured to regulate the effect of the inunction. Of these one was Gaspar Torella, physician to Pope Alexander VI. in 1498, who directed the ointment to be greatly reduced below its customary strength. A few years later, John of Vigo, a Genoese, obtained great success by using red precipitate in ointment and plasters; nevertheless, dread of the evil effects of mercury gradually caused the use of all forms of the drug to be laid aside, except by the quacks, who have owed their success throughout to an unsparing use of mercury. A striking instance of the horror our forefathers entertained of mercury, to the great advantage of the empirics who employed it, is related by Bartholomew Maggius (1559). He describes the case of a certain Count Mirandola, who after suffering for nine years from syphilis, in which time he had wasted to a skeleton, and, moreover, had infected his young and beautiful consort with his malady, called Maggius into consultation. This surgeon advised his patient to continue the use of guaiacum, notwithstanding that he had already essayed it four times in vain; for, says Maggius, on so exalted a personage, the use of mercury was out of the question.

[1] Aphrodisiacus, by Aloysius Luisinus. 2nd edition, 2 vols. Venice, 1599.

In 1508 guaiacum was brought from America into Spain, and soon became renowned by the cures attributed to its virtues. Ten or twelve years later its reputation spread from Spain into Italy and Germany. At first it bid fair to replace all other remedies, and grew to such favour that a special treatise was written on its use by Nicholas Poll in 1536. Anthony Gallus, Gaspar Torella, and others continued through the sixteenth century to recommend guaiacum, coupled with low diet, rest, and sweating, as a safe and sure remedy for syphilis. Still many physicians directed mercury to be used after guaiacum had been tried and had failed to cure.

Other drugs of home and foreign growth were soon added to guaiacum, especially China root, a variety of smilax, and afterwards true sarsaparilla, which ultimately almost superseded guaiacum as a specific. These woods were used as a decoction, called the "Decoction of the Woods," of which the patient drank some pints in the twenty-four hours. He was confined to bed while undergoing this cure, and kept to most scanty diet during the six weeks the cure lasted.

Guaiacum, with other drugs, continued on the Continent to be the general means for treating this disease throughout the seventeenth, and even into the eighteenth century. At this time Morgagni,[1] in his 58th Epistle, relates how, when he was a student, mercury was never employed at Bologna, though in his old age the drug had again come into favour. In England, mercury was never completely laid aside; indeed, so steadfast was the faith in mercury held by English physicians, that Sydenham, in 1680, freely confessed he knew of no cure for the disease, unless by mercurial salivation; he also directed that the practice of purging, bleeding, and sweating, preliminary to taking mercury, should be omitted, to avoid diminishing the patient's bodily strength unnecessarily. Abercromby, more advanced in this respect than Sydenham, though writing about the same time, described the mode of curing the disease by mercury, without reaching salivation. Thenceforward, in England, mercury became almost universally employed for venereal affections, so that in Hunter and Abernethy's time it was supposed syphilis could not be cured without mercury. While treatment by sweating and purging with low diet and vegetable drinks was steadily retiring before the use of mercury in most parts of Europe, in Egypt and northern Africa, according to Leo Africanus in 1632, and Clot Bey in 1839, it has still continued the ordinary mode of treating the disease.

Towards the close of the eighteenth century Dr. Michaelis, a Hessian, and Dr. Grant, an Englishman, both surgeons in the

[1] Morgagni: De Sedibus et Causis Morborum. 1761.

British Army during the American war, imagined they achieved wonders by treating syphilis with *opium*. Their communications attracted the attention of a certain number of English, German, and Swedish doctors, who prescribed it in doses beginning at five grains per diem, gradually increasing to fifty grains in the twenty-four hours.

The results of the experiments with opium in Christiania are given by Boeck[1] in his elaborate tables; thirty-one cases were treated with an average duration of their treatment of eighty-one days. Opium, however, had but a short-lived popularity as a specific, and has long been laid aside.

At the close of the eighteenth century Dr. Beddoes, of Clifton, the employer of Davy, afterwards the celebrated Sir Humphry Davy, published a series of cases in which *nitric acid* was used to cure syphilis. His experiments were repeated by three or four others, without, however, procuring for this medicine any enduring renown.

Simple Treatment.—Many drugs have gained favour for their supposed power in curing syphilis, which they enjoyed through the mistaken belief that syphilis cannot subside spontaneously. Until the beginning of the present century, it does not seem to have ever occurred to any proposer of a new system of treatment that, perchance, nature could overcome the disease by her unaided efforts. We now know she often does. In 1813 Fergusson[2] published some observations he made while serving with the British Army in Portugal, on the extreme mildness of the disease among the Portuguese troops; which he considered to be to some extent due to partial exhaustion of the disease among that people. Moreover, he remarked that mercury, then supposed by English surgeons to be indispensable for the cure of syphilis, was seldom, if ever, employed by the Portuguese or German doctors. This induced Rose, a surgeon in the Coldstream Guards, to allow the venereal disease in a certain number of cases to run its course unchecked by medicine. It must not be forgotten that in his day the plurality of venereal diseases was not generally recognised, and it was thought that any venereal sore might communicate the general constitutional disease. During one and three-quarter years immediately preceding the publication of his paper in 1817,[3] Rose treated 120 cases of venereal ulcer by simple means, consisting of confinement to the house, moderate diet, and cleanliness, with an occasional aperient if required. In one third of his experimental cases eruptions on the skin followed the venereal ulcer, but they disappeared completely of their own accord after a few weeks

[1] Boeck's Recherches, p. 468.
[2] Fergusson: Medico-Chirurg. Trans., vol. iv., p. 1.
[3] Rose: Medico-Chirurg. Trans., vol. viii., p. 349.

or months, and as the patients were soldiers of his regiment, he had them continuously under his observation, so that any return of the disease was readily detected. All these patients had recovered their health and strength at the time of the report, which was dated several months after their infection. The only symptom any of them suffered that denoted disease of the bones was rheumatic pain about the joints, which was observed in one or two of the cases; hence, Rose concluded that the affections of the bones, appearing in persons treated for syphilis with mercury, were the consequence of syphilis and mercury combined. In all this Rose, and those who conducted experiments similar to his, made the grand mistake of not waiting until the time had arrived when osseous affections commonly make their appearance, nor of extending their observation to a sufficiently large number of cases. The same error was committed by Thomson and Hennen in Edinburgh, by Fricke in Hamburg, by Desruelles and others in France, who caught up the 'simple treatment,' as it was called, with enthusiasm.

In consequence of the discovery that syphilis in some cases will cure itself if left alone, it was presumed that it would do so always. Mercury was not only again cast aside, but all the evils previously attributed to syphilis were again one by one laid to its door, and great prejudice arose against employing the drug. Rose himself quickly saw the error he made, for we learn from Sir B. Brodie [1] and Cutler,[2] that Rose, having satisfied his mind that all venereal ulcers would heal without mercury, still habitually employed it in the treatment of syphilitic sores. He found that by giving mercury during the healing of the ulcers the frequency of general eruptions was diminished, and the course of the disease materially shortened. This conviction was forced on the minds of many others, who tried 'simple treatment' of venereal ulcers. John Thomson,[3] of Edinburgh, who in 1818 wrote a description of his non-mercurial treatment of the disease, returned to the use of mercury when time had enabled him to extend his observations,[4] for he found that abstention from mercury did not render relapses less frequent or less severe. The success of Rose's experiments induced many to repeat them. In 1819 the Army Medical Board published a circular,[5] setting forth the results of 1940 cases of primary venereal ulcer treated without

[1] Brodie: Surgical Works, vol. ii.

[2] Cutler: Evidence before the Committee on Venereal Diseases in the Army and Navy. Question 4105.

[3] Thomson: Edinburgh Medical and Surgical Journal. January, 1818.

[4] Simon: die Behandlung der Syphilis ohne Mercur. Hamburg, 1860, S. 159. A footnote, in which Boenek states that when visiting Edinburgh in March, 1827, Thomson stated his experience as given in the text.

[5] Printed in Hennen's Military Surgery, p. 551. London, 1829.

simple treatment for more expeditious means of curing the disease. Nevertheless, some prejudice against the proper employment of mercury has yet to be reasoned away.

Among the most persistent opponents of mercury is Joseph Hermann,[1] who has published his theories on many occasions, illustrating them in the latest edition of his book with some admirable drawings of ulcerating tertiary syphilides which are put forward by him as specimens of chronic hydrargyrosis. Després[2] also set forth his opinions in a discussion on the value of mercury in syphilis which took place at the Society of Surgery of Paris in 1867. On this occasion Després was opposed by most of the leading surgeons of Paris. Oewre[3] does not go so far in his opposition to mercury as the two former writers, but he maintains that it need seldom be administered in the treatment of syphilis.

The benefit obtained from the researches in the first quarter of this century was threefold: first, they showed that all venereal ulcers could be healed without mercury; second, that this drug was not the cause of the relapses so frequent in syphilis; lastly, that very much less mercury was required to control that disease than had been previously supposed to be necessary. Beyond this, nothing has been gained by the non-mercurial treatment of syphilis. That drug is left now, as before, the most potent and trustworthy specific for dispelling the symptoms and curtailing the course of the disease.

A very important addition to the materia medica was made when *iodide of potassium* was first employed in England for curing syphilis in 1831 by Dr. Robert Williams. Wallace,[4] of Dublin, very soon tried the new drug extensively, and the results of his experiments drew general attention to it in this country; while Ricord's repetition of the same experiments firmly established the reputation of iodide of potassium on the Continent.

Elimination by irritation.—Several methods of exciting irritation of the surface of the body have been tried with the hope of thereby getting rid of the poison of syphilis. Blistering, inunction of tartar emetic ointment, vaccination, and syphilisation, have all been employed for this purpose. The first three methods were for a short time in repute on the Continent, but had only a temporary notoriety. Extensive trials of tartar-emetic inunction were made by Hjort of Christiania, and accounts of them published in Bidenkap's "Aperçu." Syphilisation[5] has been long ago proved to be useless as a method of

[1] Hermann: Ueber die Wirkung des Quecksilbers auf den menschlichen Organismus. 1873.
[2] Després: Traité de la Syphilis. 1873, p. 464, *et seq.*
[3] Oewre: Archiv f. Dermatologie u. Syphilis. 1871, ii., S. 1.
[4] Wallace: Lancet. 1836, vol. i.
[5] For further information respecting syphilisation, see Chap. XV., p. 363.

treatment, but it rendered valuable service to science by allowing the disease to run its course uncontrolled; and thus furnished a large number of observations of the natural progress of syphilis.

Therapeutic Treatment.

General Management.—In treating syphilis, several points must be borne in mind. First, the natural tendency of the disease to subside in a large proportion of those affected, and in many to disappear ultimately altogether, independent of the influence of treatment. Secondly, the great obstinacy and often incurable character of syphilis in certain persons. In such persons the disease often continues active for eight or ten years, or, by relapses, with short intervals of health, even for life. The third consideration is the aptness of the disease to cause debility by checking nutrition, a consequence which is particularly frequent in children and young growing persons. The last two considerations are sufficient to render treatment necessary in all cases, because we have no certain means of knowing at the outset, whether any given case will have a light or severe course, a short or a long one, whereas we know that the severe cases can be shortened and greatly alleviated by medical treatment. Thus, the indications to be followed in treatment are—1. To insure the highest possible condition of bodily vigour. 2. To control the influence of the poison. 3. To dissipate and heal the local affections of the disease.

The bodily vigour must be maintained by attention to all the functions. The patient must be particularly cleanly, for while the eruptions are on the skin much benefit is gained by stimulating the circulation through it, and by clearing the surface of débris and dirt. The patient should wash the surface of the body every day, and twice weekly take a warm bath with soap. The Turkish bath suits many persons, but in some it produces a debility which soon becomes disagreeable. The clothing should be always warm; flannel should be worn next the skin, and a great coat when the weather is cold. The teeth must be frequently and carefully cleaned and kept free from tartar, for these precautions have great influence in preventing irritation of the mouth while mercury is being taken. The gums, especially in uncleanly persons, are often inflamed and swollen; to remedy this they should be washed with some astringent solution. The diet should be light and sufficient, and excess in alcoholic liquors strictly prohibited. Meat and wine must be given in quantities necessary to preserve the patient's strength at its height. Smoking in moderation probably does no harm to those accustomed to it if the lips and

throat are sound, but it is difficult to cure any sore in the mouth or fauces if the patient continues to smoke. Regular action of the bowels must be secured by medicine if necessary; a glass of Friedrichshalle or Hunyadi Janos water every morning on an empty stomach, or a scruple of sulphate of magnesia in an ounce of infusion of quassia or gentian, once or twice daily, will commonly effect this. Bodily exercise, if not carried to an extreme, is beneficial. Hunting, rowing, dancing, cricket, &c., if very moderately indulged in, are harmless, though an overstrain of the muscular power is highly injurious, by producing a debilitated condition in which the disease, especially if the patient is still young and growing, is very apt to become severe. Sexual intercourse must be abstained from for many reasons. This direction should never be omitted, for the patient is seldom aware that the disease is communicable to others after the initial lesion has healed.

If the patient be not robust he will profit by taking a tonic in some shape, of which F. 29, 30, are useful forms. Cod-liver oil is often exceedingly beneficial if the patient be thin or phthisical.

In laying down rules of conduct regard must always be had to the patient's avocation, and he should be urged to apply himself regularly to business or study, that his life may be the more free from excess, and his mind diverted from the slow progress his disease will make in spite of all that can be done by art to hasten it.

Period preceding general eruption on the skin.—During the interval between communication of the disease and its manifestation on the skin and mucous membranes, the patient frequently does not apply for treatment, as he is unaware of the nature of his complaint. Directions should be given for cleanliness, and the use of warm clothing in cold weather. The diet should be moderate, and gentle exercise must be taken, though riding, shooting, or rowing, should be avoided while the initial ulcer is unhealed, and while the inguinal glands are enlarged, lest acute inflammation be excited in those parts. As the patient usually applies to his doctor for some local affection besides his general constitutional state, he must receive directions requisite for its cure.

Special Management.—*Treatment of the initial lesion.*—Extirpation is strongly recommended by some authors. Sigmund [1] advises excision by the knife, or removal by the active cautery, or destruction by caustics, but does not say positively that he has himself succeeded in warding off constitutional disease by this procedure. The experiments of Auspitz and others on excision of hard sores have been referred to in Chapter II. where we have already expressed our

[1] Sigmund: Neuere Behandlungsweisen der Syphilis. 1880, p. 37.

opinion on the subject. The primary manifestation of syphilis, though naturally indolent, sometimes becomes, through neglect of cleanliness or other causes, a freely discharging sore that causes much pain and inconvenience. In this case, the sore must be dressed with lint soaked in warm water, and renewed every three or four hours till the irritation is subdued by rest; or some preparation of iodoform (F. 57, 58, 79) may be used. If the initial lesion slough or become phagedænic it must be treated according to the directions given in the chapter on Chancre. Attention must be paid to the diet, and to the action of the bowels and kidneys. If the tongue be large and furred, and the appetite failing, the patient will do well to take three or four grains of blue pill, with as much compound extract of colocynth at bedtime, and a saline draught next morning. If, as sometimes happens, the irritation of the sore excite sympathetic action in the neighbouring lymphatic glands, they should be fomented four or five times a day, and a poultice of linseed meal applied between the fomentations, the patient keeping as much as possible in the horizontal position. Under this treatment the irritation and pain usually subside, the sore ceases to secrete much pus, and acquires its ordinary indolent condition, or begins to cicatrise. The glands also lose their tenderness, and, if matter have not formed, gradually regain their former condition of general painless enlargement. If abscess be produced, it must be treated as an ordinary bubo (see the chapter on Chancre). When the irritation has subsided the patient may get up and take moderate exercise, though he should not dance nor hunt till the sore is quite healed, lest the chafing and excitement rekindle the inflammation that has been so recently subdued. The local application to the sore should be very slightly stimulating; frequent washing, and the application of wet lint are usually sufficient, or the patient may use a solution of sulphate of zinc of one or two grains to the ounce; or the liq. plumbi subacet. dil. of the British Pharmacopœia: black or yellow wash (F. 24, 25) is appropriate when the surface is indolent. In balanitis it is essential to keep the glans separated from the foreskin by lint. Any strangulation or swelling of the prepuce, if not relieved by rest and cool lotions, must be incised at the constricting points. The enlarged glands, when all irritation has subsided, may be compressed by a pad of lint and a spica bandage. The penis, when the chancre is large, should be supported and protected in a suspensory bandage.

The treatment of initial lesions of the *female genitals* is very similar to that already given for sores in men, but the conformation of the pudenda renders cleanliness far more difficult. The patient should be instructed to use the vaginal douche three or four times daily, to dress all excoriated surfaces with rag dipped in lead lotion,

and to arrange the dressing so that it intervenes between opposed surfaces; a dossil of cotton wool moistened with lead lotion and slipped within the vagina, is more readily retained there than lint, and keeps sores of the entry moist with the lotion. Iodoform is here most useful and may be applied in the form of dry powder or as a paste (F. 58) or dissolved in oil (F. 79). The patient should keep quiet, and lie down as much as possible. If the nymphæ become œdematous and inflamed, and the glands tender in the groin, the parts should be fomented every three or four hours, and folds of old rag or muslin laid between the labia and nymphæ, while the patient keeps her bed and takes some saline febrifuge draught.

The condition of the uterus should be ascertained as soon as the sores of the entry of the vagina will permit the passage of a speculum, and the discharges or erosions of that part treated as directed in the section on local treatment of uterine venereal affections.

When the induration of the initial lesion renders the diagnosis that of syphilis, the question of treatment for the general disease must be considered. In England the most general plan is to administer specifics at once. On the Continent and in America, this course is also the prevailing one; but there are still those who refrain from specifics either altogether or during the early exanthems. Zeissl[1] advocates the simple or expectant method of treatment; but employs mercury in all cases where the patient's progress is slow, or when the morbid action is situate in some organ that may be quickly and irreparably damaged by the disease—the eye or brain for example. Since 1869, he has been investigating this subject, and after ten years' experience, has adopted the following general plan of treatment. For the initial sore he uses simple applications. When the early general exanthems appear he gives the iodide of potassium; and lastly gives mercury, mainly by subcutaneous injection, when the cutaneous eruptions do not subside in six weeks, or when, as just said, some dangerous complication arises. Sigmund[2] also, after advocating for many years the early exhibition of mercury, now advises simple non-mercurial treatment during the early stages. This course he maintains, shortens the duration and lessens the severity of the after stages. Krówczynski[3] maintains (a view not altogether novel) that syphilis is best treated by assisting the processes of tissue-change; that when these are active mercury is not needed, but when they are sluggish, mercury may be beneficially employed to stimulate

[1] Zeissl: Zur Therapie der Syphilis. Allgemein. Wiener Med. Zeitung. 1879, Nos. 1, 2, 3, 4.
[2] Sigmund: Neuere Behandlungsweisen der Syphilis. 1880, p. 74.
[3] Krówczynski: Vierteljahr. für Derm. u. Syph. 1880, p 211.

them. Diday[1] has arrived at the conclusion that when the induration of the initial lesion is copious, it is expedient to give mercury without delay; but when the initial hardness is of small extent, and the consecutive enlargement of the lymphatic glands is also ill-marked, the subsequent course of the disease will be of such a kind that delay in applying specific treatment is unimportant. We differ from Diday; for we believe that the late developments of a given case of syphilis cannot be foretold with any amount of accuracy in its early stages. The instances in our own experience are numerous where the disease has been mild in its early stages, and most severe and destructive in its later ones. Indeed, there is strong presumption that early and assiduous treatment of the early forms prevents the future production of gummata or other tertiary affections. In this belief we are supported by others of equal experience with those whose names we have just quoted, who as strongly advocate the immediate administration of mercury. Among them we may mention Fournier[2] and Hutchinson.[3] The circumstances which lead us to prescribe specific treatment (in nearly all cases using mercury as the specific), as soon as the diagnosis of syphilis is posed, are recounted in the section on *mercury*.

The Period of General Eruptions.—The short period of lassitude, inappetence, and headache that in many cases precedes the outbreak of a rash on the skin, is best treated by a saline purge to clear the bowels, after which mercury should be given. The discomfort subsides in a marvellous manner as the patient's system feels the influence of mercury. Women and lads are more susceptible to the influence of this drug than full-grown men; hence a smaller dose suffices for such persons. In this stage the patient is liable to become weakly, wherefore his diet should be good, and tonics should be given along with the mercury. The management of the general health is also of the greatest importance, and the directions already laid down must be complied with.

Mercury.—*Physiological effects.*—Mercury is employed as the result of long empirical experience to act as an 'alterative' or tonic, to cause an increase of growth and production of better nourished and better developed tissue when the body is below the normal state. Liégeois[4] in 1869 observed by experiment that minute doses, 1 milligramme ($\frac{1}{65}$ grain), of corrosive sublimate injected under the skin caused both men and animals to increase in weight, and that larger doses had the contrary effect, being fatal to animals when

[1] Diday: Thérapeutique, &c., p. 265—7.
[2] Fournier: Syphilis chez la Femme. 1873, p. 1052, *et seq.*
[3] Hutchinson: Lancet, vol. i., 1874, pp. 86, 157.
[4] Liégeois: Gazette des Hôpitaux. 1869, 3 Août, p. 350.

the amount just stated was doubled, but his experiments were too limited in number to have much importance. The report of Hughes Bennett[1] on the action of mercury and other drugs contains examples confirming the observations of Liégeois as to the effects of mercury in animals. In 1874 Wilbouchewitch[2] counted the blood-corpuscles in early syphilis in ten patients at the Hôpital du Midi. He found that the red corpuscles got fewer in the stage of the initial lesion and enlarging lymphatic glands of syphilis. Further, that mercury taken internally caused the number of red blood-corpuscles to increase for a period ranging between nine and twenty-one days. But if the use of mercurials was prolonged, the number of red blood-corpuscles diminished again. Ricord and Grassi[3] found many years before that while iodide of potassium increased, mercury diminished the number of red blood-corpuscles in early syphilis. The result so far as their trials of mercury were concerned apparently differed, not only from the received opinions respecting the tonic influence of mercury, but also from the precise observations of Liégeois and Hughes Bennett. Keyes,[4] however, by his careful experiments in counting the red blood-corpuscles has brought the observations of his predecessors into harmony with each other and with general experience. Keyes counted the number of red discs in the blood of six healthy, and of twenty-one syphilitic persons more than five hundred times. From these observations he has arrived at the following conclusions:—"1. 5,000,000 red blood-corpuscles in the cubic millimetre is a full high average for the healthy adult male. Anæmia very rarely goes below 3,000,000. Fine conditions of physical health reach above 6,000,000. In ordinary seasons, in the city, 4,500,000 would indicate a fair state of health. 2. Mercury decreases the number of the red cells when given in excess, especially in hospitals (Wilbouchewitch). 3. Syphilis diminishes the number of red corpuscles below the healthy standard. 4. Mercury in small doses continued for a short or long period in syphilis, alone or with the iodide of potassium, increases the number of red corpuscles in the blood, and maintains a high standard of the same. 5. Mercury in small doses acts as a tonic upon healthy animals, increasing their weight (Liégeois, Bennett's report above referred to). In larger doses it is debilitating or fatal. 6. Mercury in small doses is a tonic (for a time at least, as long as the experiments lasted,) to individuals in fair health, not syphilitic. In such individuals it increases the number of the red blood-corpuscles."

[1] Hughes Bennett: Report on the Action of Mercury, &c., on the Biliary Secretion. British Medical Journal, 1869, May 8, p. 411.
[2] Wilbouchewitch: Archives de Physiologie normale et pathologique. 1874, p. 509.
[3] Fournier: Leçons sur le Chancre, par Ricord. 1860, p. 189.
[4] Keyes: Tonic Treatment of Syphilis. 1877.

The most usual channels for the entry of mercury are, the skin, the air-passages, the alimentary canal, and the subcutaneous cellular tissue. In what forms it may be absorbed is not precisely known; probably, if introduced through the skin it retains its metallic condition; when taken into the alimentary canal, it is possibly absorbed as the perchloride combined with albumen, but this is uncertain. Overbeck[1] and Isidor Neumann[2] discovered it in the form of minute globules in the sweat- and sebaceous glands and in the hair bulbs, in patients who had recently undergone inunction, and it has also been discovered in a similar form in the interior of the lymphatic glands, in the liver and in the spleen.[3] By chemical tests mercury may be detected even more generally. For example, Neumann in his experiments found it in the serum of the thoracic and abdominal cavities; and, it may usually be detected in the urine, the saliva and the fæces, and more rarely in the sweat. It has been found in the milk of lactating females on whom inunction has been practised. Kahler[4] and Klink[5] precipitated metallic mercury from human milk on a gold electrode, from which they sublimed it in the presence of iodine, thereby producing brilliant red crystals of biniodide of mercury.

When absorbed, mercury is stored chiefly in the viscera, being found post mortem most abundantly in the liver and spleen; but also, though in less quantity, in the brain, lungs and kidneys. Nevertheless, the major part of the mercury is eliminated in a few hours after absorption; the urine and intestinal juices being probably the channels by which it principally escapes from the system. Mayençon and Bergeret[6] found that of the amount ingested, whether in the metallic form or as a salt, the major part is quickly eliminated, only a small proportion being carried into the tissues. That small remainder is ultimately and, unless the administration be very prolonged, also speedily eliminated. Schmidt[7] has also investigated the elimination of mercury in the secretions. He found the amount in the urine was much greater when the mercury was given by subcutaneous injection than when mercurial ointment was rubbed into the skin. In searching for mercury in the saliva, Schmidt often failed to find it, though in some cases he detected it readily, both in the buccal mucus and in the saliva of the parotid gland even when no symptoms of salivation were present. Byasson,[8] Chief

[1] Overbeck: Mercur u. Syphilis. 1861.
[2] Neumann: Practitioner. 1871, vol. vii., p. 279.
[3] Blomburg, (quoted by Hallopeau, Du Mercure, &c., Paris, 1878, p. 48), found metallic globules in these organs of cats fed on blue pill.
[4] Kahler: Vierteljahresschrift für Derm. u. Syph. 1875, S. 391.
[5] Klink, ibid. 1876, p. 207.
[6] Mayençon and Bergeret: Robin's Journal d'Anatomie. 1873, No. 1.
[7] Schmidt: Petersburger Mediz. Wochenschrift. 1879, No. 22.
[8] Byasson: Robin's Journal de l'Anatomie et de Physiologie. 1872, vol. viii., p. 500.

Pharmaceutist to the Midi Hospital, made some careful experiments to ascertain the rapidity with which bichloride of mercury was eliminated when taken into the stomach. He detected mercury in the urine about two hours, and in the saliva about four hours, after its ingestion. He also detected it in the fæces excreted in the twenty-four hours succeeding its administration; but it disappeared from the urine and saliva in about twenty-three hours after it had been swallowed. Vajda and Paschkis[1] made 202 chemical experiments for the detection of mercury in various tissues. They most commonly found it in urine; but also, though rarely, in the saliva, milk, menstrual blood, liquor amnii, soft parts of a fœtus, placenta, bones, and the substance of gummata. The time of its excretion was usually prolonged after its administration had ceased; and often did not commence until the drug had been left off, especially when mercury was introduced by inunction. Its extrusion was most rapid when the more soluble forms of the drug were employed. According to the researches of these observers, mercury does not accumulate in the tissues but is gradually got rid of altogether. Lastly, the valuable monograph of Hallopeau[2] on the physiological and pathological action of mercury may be consulted for full information on all that relates to this subject.

Therapeutic use of mercury.—In the historical sketch it has been pointed out how every attempt to subvert the influence of mercury in treating syphilis has successively fallen to the ground; how, in the fifteenth and sixteenth centuries, the mischief that accrued from its unmeasured employment, brought mercury into disfavour; though it gradually recovered and maintained its position until the beginning of the nineteenth century, when the discovery that mercury is not always indispensable for the cure of syphilis led to its being again discountenanced by many surgeons. Yet it is now generally admitted that no other medicine exerts so much influence over the progress of syphilis, while we have satisfactory evidence, collected by Kussmaul, that mercury has no power to produce certain late affections in syphilis as is still by some maintained. Mercury is injurious to syphilitic, just and only as it is injurious to non-syphilitic persons, namely, by producing its poisonous effects upon the system. These can be almost wholly avoided, while the useful influence of mercury is secured, if the drug be administered with due precautions. The advantages which are well ascertained to result from giving mercury in syphilis are these: if given early, it promotes the dispersion of the initial induration and of the glandular enlargement;

[1] Vajda and Paschkis: Ueber den Einfluss des Quecksilbers auf den S. Process mit Berücksichtigung des sogenannten Mercurialismus, &c. Wien, 1880.
[2] Hallopeau: Du Mercure, &c. Paris, 1878.

it delays and lessens the severity of the early cutaneous eruptions, and of all the symptoms which accompany them. In the later forms of syphilis, though not so generally applicable, it is often more serviceable than any other medicine. It cannot always be borne at these stages, and sometimes, but less often, it fails of effect; more rarely still, it does positive harm. In a few instances the disease is at once arrested when the patient is submitted to the influence of mercury, and probably all patients who can take it have their disease more or less curtailed. Mercury is sometimes injurious if given to persons very much broken down in health, or affected by renal disease; but even in these cases it is impossible to lay down any prohibitive rule, because it frequently happens in such persons, when syphilis is the cause of their debility, that mercury restores their strength more rapidly than any other medicine. It is also commonly believed that the vesicular and ulcerating syphilides are not benefited by mercury; but patients with these eruptions sometimes resist all plans of non-mercurial treatment, while they recover rapidly under mercury.

Cases in which mercury is appropriate.—When the patient is in fair health, and has a hard-based indolent ulcer or excoriation with enlarged inguinal glands, mercury should at once be administered. In the early eruptions, as well as in the later papular or scaling forms, mercury is particularly useful. In progressive ulceration of the skin in late syphilis, if iodide of potassium fail, mercury often arrests the disease at once. If a syphilitic woman become pregnant, she should take mercury during her pregnancy, that the child may be shielded from contagion. Whenever the patient, during a long course of syphilis is enfeebled and reaps little benefit from ordinary tonic and restorative treatment, he will often regain his power of digestion and bodily strength when brought under the influence of mercury. In young children the drug is almost always well borne, and is the most rapid restorative they can receive. In short, whenever the disease makes no progress without it, however late the stage or whatever the form, mercury should be used. The maxim "iodide eases, mercury cures," is rarely inapplicable in obstinate cases of syphilis. Indeed, however completely the symptoms may have been dispelled by iodide of potassium, the cure should be rendered lasting by a finishing course of mercury.

The length of time during which mercury should be administered is very difficult to define. Without over-estimating the value of mercury in checking syphilis, it may be confidently asserted that in numerous cases the disease has a very short course when the administration of mercury is commenced as soon as the indurated base of the ulcer and the accompanying adenopathy show the

presence of syphilis unmistakably. There is also good foundation for the belief that steady prolonged mercurial treatment, though not an infallible means, is the only trustworthy one for preventing a return of the disease. Perhaps the best results are obtained by administering the drug until all symptoms have subsided, and by continuing to give small quantities for two or three weeks longer, after which a pause of four or six weeks' duration should be allowed before the drug is again repeated during a second course of three months. At the end of this second course another month's interval may intervene before a third course is begun. In this way mercury should be given more or less continuously for a year after infection. By this time, should no symptoms be present, medicine may be withheld altogether, while the patient is kept under observation to watch for any further outbreak of the disease. This is most apt to recur on the fauces or tongue, where the formation of an ulcer or fissure is the signal for treatment to be recommenced. The patient must in all cases be prepared to expect occasional relapses for two years after he has contracted the disease. He should also be cautioned that relapses may, in rare cases, occur after a much longer interval, and that any kind of treatment can only aid nature in exhausting the activity of the poison.

The effects of mercury.—The influence of mercury is essentially the same by whatever channel it is introduced. When taken to control syphilitic disease, the earliest effect is relief from the languor that often precedes the eruption. If a rash is present it grows pale, the spots sink down, and ulcerated surfaces begin to heal. Next to these changes, provided the dose be large enough, come the characteristic effects of the drug on the system. The gums behind and around the upper incisors and last lower molars swell, grow tender and spongy, and the teeth ache when snapped together. The swelling quickly extends along the gums till they project around, and partly conceal all the teeth; the whole mucous membrane of the mouth becomes affected; the tongue, furred on the surface, is indented at the sides where it presses against the teeth; the cheeks are marked in the same manner, and not infrequently excoriated opposite the cusps of the teeth. This condition of the mouth is accompanied by fœtor of the breath, coppery taste, and increase of the saliva; but it is not necessary for therapeutic purposes to excite so much action as this. In most persons all the useful effects of mercury are attained when the slightest possible sign of its influence is betrayed by the gums; but exceptions are met with. We have marked several instances where the syphilitic symptoms were unaffected until the irritation of the gums had reached the condition just described. Further mercurialisation is seldom beneficial; but in a few cases nothing short of

violent salivation affects the disease. For instance, a woman who had been attending at the Lock Hospital for ten years with a tubercular syphilide, deriving only transitory benefit from treatment, on one occasion by mistake swallowed about ten grains of mercurial ointment every night for twelve nights. This produced violent salivation with the loss of two teeth; but her syphilitic symptoms vanished, she gradually regained her good looks, and has enjoyed good health ever since. Others, among whom is Schützenberger,[1] insist upon the necessity for pushing the influence of mercury to a tolerably smart action in obstinate cases of syphilis. Bumstead[2] states that patients are more easily salivated when first commencing to take mercury than afterwards. Our observations do not confirm this. We have repeatedly found that a particular form or small excess in the quantity of mercury will excite stomatitis as readily in a person who has been taking mercury for some time as it did when he began his treatment.

Salivation.—If the irritation become violent, the gums ulcerate, suppuration extends to the lining membrane of the alveoli, and the teeth loosen; tenderness with swelling and throbbing of the salivary glands, and copious secretion of saliva accompany the other symptoms. These milder forms of mercurial poisoning are often set up by inadvertence. Further effects, namely, necrosis of the alveoli, fall of the teeth, abscess of the parotid, are extremely rare at the present day. The local effects are not infrequently accompanied by symptoms of general disturbance, fever, headache, loss of appetite, griping, purging with bilious stools, &c.

There are also patients, rarely met with it is true, to whom the smallest doses of mercury are violently poisonous. In a patient recently under our care for chronic prostatitis and cystitis without marked albuminuria, three pills, each containing one grain of blue pill in conjunction with compound rhubarb pill taken on consecutive days, caused well marked mercurial stomatitis and fœtor of the breath. Quinlan[3] noted an instance of a patient who died from profuse salivation, sloughing of the tongue and general prostration twenty-six days after taking, in three doses, five grains of blue pill. This patient had albuminous urine and large fatty kidneys. Robinson[4] has also reported the case of an old gentleman who was salivated after a few days' application of black wash to an eczematous eruption of the skin.

[1] Schützenberger: Gazette Médicale de Strasbourg. Mai, 1874. Vierteljahresschrift f. Dermatologie u. Syphilis. 1875, p. 394.
[2] Bumstead and Taylor: Venereal Diseases. 1879, p. 805.
[3] Quinlan: British Medical Journal. 1876, June 17, vol. i., p. 754.
[4] Robinson: British Medical Journal. 1878, March 17, vol. i., p. 367.

The distinctions of mercurial affections from those due to syphilis must be mentioned. The affections of the mouth caused by mercurial irritation are shallow widely extending ulcers, with ashy-grey surface and red areola, very tender and seated on a swollen spongy surface. A very common locality for these sores is the border of the tongue, the mucous membrane surrounding the wisdom teeth, and the buccal surface of the cheek. They are always accompanied by general œdema of the mucous membrane of the mouth, copious viscid mucus, and by a peculiar evil smell that may be recognised several feet from the patient. Such signs are sufficiently peculiar, but there are others purely dependent on mercurial irritation which are less unlike syphilitic lesions. For example, painful shallow ulcers or excoriations of the tonsils and pharyngeal mucous membrane, covered with scanty adhesive secretion, while the membrane generally is dull red and dry. The gums and mucous membrane of the cheeks and tongue are not œdematous, hardly swollen. This condition of the mouth causes much distress to the patient, who is generally in a somewhat depressed or debilitated state of health. The diagnosis of these excoriations from those occasioned by syphilis depends on their multiplicity, for, instead of two or three sores, there are several, eight, ten, or a dozen; the amount of pain produced is also much greater than superficial lesions from other causes excite: while the continuance of distress to the patients so long as the mercury is administered, and the immediate improvement that follows its discontinuance, are satisfactory distinctions of mercurial sore throat from syphilitic angina.

The earlier symptoms of salivation are best relieved by discontinuing the mercury, and giving a smart purge of colocynth and sulphate of magnesia, then chlorate of potash and bark (F. 33). If deglutition be painful, the food must be liquid; strong soups thickened with arrowroot are most readily swallowed. The mouth should be frequently washed with an astringent lotion (F. 1, 2, 3), and the teeth cleaned several times daily with a soft brush, especially after eating. Exposure to damp and cold is not infrequently the exciting cause of an attack of stomatitis in persons taking mercury; hence, all such persons must be cautioned against this danger.

Salivation is not the constant sign of injurious action, which may be also shown by depression, sweating, dyspepsia, loss of appetite, or purging. In those who sweat freely, mercury sometimes excites eczema, especially about the flexures of the joints. Nervous irritability and anæmia are in others the most prominent symptoms of the injurious action of mercury. After very prolonged use of the drug a peculiar tremor sometimes comes on, but is hardly ever seen except in persons who work among mercury.

Albuminuria sometimes occurs as a result of the toxic action of mercury. Gubler[1] is of opinion that this affection is not always associated with lesions of the kidney itself, but that it may be caused by dyscrasia. Ollivier compares albuminuria due to mercury with that caused by lead, and thinks that both forms depend on 'renal steatosis.' A very full account of a case under the care of Bouchard in which fatal suppression of urine occurred in a man aged 37, after mercurial inunction, is given in Hallopeau's[2] work.

Some persons appear insusceptible to the action of the drug; they neither get sore mouths, nor depression, nor purging, and their syphilitic symptoms acknowledge to a very slight extent the influence of mercury. An instance of this resisting power may be related. A young gentleman, 19 years old, of excellent health and strength, had a very large indurated ulcer beneath the prepuce, and enlarged glands of the groin. In consequence of this, attempts were continued in vain during four months to make his gums sore by frequent doses of blue pill, iodide of mercury, and calomel; by mercurial fumigation, and by subcutaneous injection. After the last method the gums were slightly swollen, but only for a few days.

Modes of giving mercury.—In the great majority of cases the most convenient mode of administering mercury is by the stomach. It is also occasionally introduced into the rectum or vagina in the form of suppositories (F. 83, 85); but ere long it sets up tenesmus and dysenteric symptoms in the one case and vaginal catarrh in the other. Mercury is applied to the surface of the body by inunction, by vapour baths, or by bathing in a solution of the perchloride. It is also injected subcutaneously.

Before administering mercury by the *internal method* to a person who has not previously taken it, certain precautions should be adopted. Whatever variety of the drug be selected, the dose should be small and in a form not likely to excite disturbance of the bowels. Blue pill and grey powder are the least irritating forms of mercury, and in most cases are the best preparations to begin with. They should be given in small doses with the food several times daily; (F. 61, 62). This mode of administration will be found more effective than a larger dose at bedtime, and is much less likely to cause irritation of the alimentary canal. If blue pill be employed to produce the effect of mercury rapidly, a larger dose will be necessary (F. 63). Under all circumstances it is desirable to see the patient again on the fourth or fifth day, that the effect of the mercurial may be observed; where large and frequent doses are being taken, he must be seen daily. If the gums are not beginning to swell after a few days,

[1] Gubler: Leçons inédites. 1870. Quoted by Hallopeau, loc. cit., p. 112.
[2] Hallopeau: Loc. cit., p. 113.

the dose may be increased, or the form be changed for some more active preparation. When the drug begins to be felt, the patient should omit his dose for a day, then continue with about two-thirds of the quantity at first employed per diem; this will keep up the requisite influence and avoid any injurious effect.

The perchloride is used on the Continent in the early stages of the disease. It is the basis of Van Swieten's solution (F. 34), represented by Liq. Hydrargyri Perchloridi in the British Pharmacopœia. In this country the perchloride is generally reserved for relapses that do not readily yield to iodide of potassium, as it is ill adapted for producing the requisite effect of mercury quickly, for if taken in sufficiently large doses to produce tenderness of the gums, it is apt to irritate the bowels. Hence it is better suited to the later forms of the disease where the action of mercury is required only to a slight degree. A useful mode of giving the perchloride, especially for gouty persons, is to mix it with iodide of potassium, whereby a freshly formed solution of biniodide of mercury is obtained (F. 37).

The perchloride can be borne for a long time in quantities not exceeding a quarter or a third of a grain per diem in divided doses. In the form of pill it is liable to become decomposed, and should be mixed solely with sugar of milk as the excipient (F. 66). The perchloride may be very usefully given to anæmic patients with perchloride of iron (F. 35).

Bicyanide of Mercury.—This form is similar in its effects to the perchloride, but is a more stable salt, and may therefore be safely prescribed in pills, where a long continued mild course of the drug is desired (F. 67).

The Green Iodide (Protiodide) of Mercury is a favourite preparation with some surgeons on account of its great activity and solubility; though from the readiness with which it decomposes, it sometimes fails to produce any effect, while, on the other hand, it is more apt than blue pill, calomel, or the perchloride, to cause griping and purging; hence, except in very small doses it cannot be prescribed without opium, lettuce, or logwood, &c. (F. 64, 65). It may be used to replace the other forms of mercury.

The Red Iodide of Mercury is less readily decomposed than the green iodide; it is very useful in relapses of the scaly eruptions (F. 38).

Plummer's pill is given occasionally; but is very untrustworthy owing to its insolubility. The pills may be sometimes recovered from the fæces as hard as pebbles. When absorbed it produces the usual effects of mercury on the system (F. 68).

In Germany a preparation of mercury with sarsaparilla and aromatics, called *Zittmann's Decoction of the woods* (F. 44), is much

used. It is generally combined with limited diet, purging and sweating, and it is employed when the disease is inveterate. Zeissl gives it in conjunction with mercurial inunction. Without this combination we have rarely seen lasting benefit derived from administering Zittmann's decoction; but as an aid to mercurial inunction we have been thoroughly satisfied of its value in certain cases. Owing to the inconvenience to which it subjects the patient, recourse is seldom had to it. The amount of mercury employed is rarely sufficient to produce disagreeable effects, while the perspiration, diuresis and slight laxation of the bowels hasten the absorption of obstinate syphilitic productions. We have employed the method for removal of obstinate induration of the tongue or severe and recurring plantar and palmar scaling eruptions. The course of treatment extends over four or six weeks, and comprises strict diet and regimen, besides the inunction and daily potion of the decoction. The patient must be in bed for fourteen hours daily, and in his room for eighteen of the twenty-four. A light breakfast is given early, and one hour later a hot-water or vapour bath, to procure sweating. While the skin is bathed in perspiration a rubber rubs in thirty to sixty grains of mercurial ointment, and the patient then lies for two hours freely perspiring in the blankets. After this he rises, wipes the sweat off, and dresses in flannel underclothing. He then takes a light meal and walks for one or two hours if the weather be dry and not very cold. In the evening he returns to his room, is well covered with blankets, and sweats again for an hour before going to sleep. The next day the same course is repeated. The diet is limited to one meal of meat; the other consists of fish, eggs and vegetables; and for drink, weak tea or coffee and milk. No fruit nor alcoholic liquors are allowed. The medicines given consist of a pint to a quart of Zittmann's decoction (made according to F. 44), during the day; and every other morning a dose of Friedrichshalle or other saline purgative. During the treatment the gums are carefully watched, and the least approach to salivation is the signal for withholding the inunction or repeating it only at such intervals as may maintain slight puffiness without soreness of the gums. The frequent use of alum solution as a wash for the mouth, and the preliminary cleaning and stopping of the teeth are requisite to remove all artificial irritation of the gums during the course. Some patients bear the eliminative treatment only for a part of the time usually requisite. At first they profit greatly; the functions act naturally, appetite and sleep are good, and a sense of good health is experienced that greatly cheers them. This pleasant state in most cases continues throughout the course; but in a few, after two or three weeks, giddiness or restlessness is felt. When such signs

appear, a short intermission is desirable, after which the patient may resume his course to clear away his symptoms thoroughly.

Another mode of treatment, also bearing the name of Zittmann, is that revived by Hebra and described by Tilbury Fox.[1] The plan is a combination of purging and sweating with low diet and rest in bed in a warm room. These decoctions (F. 45) however do not contain mercury. Shillitoe,[2] among others, recommends this mode of treatment for chronic cases of syphilis.

There are several other systems of treatment which have gained popularity from time to time and have been vaunted for some mysterious excellence, but which after a short season of fashion have fallen into desuetude. For example, the so-called "*Dry Method*" of the Arabs, which was tried in Marseilles and Montpellier[3] with some success. It consists in giving the patient two, three, or more pints daily of decoction of sarsaparilla, and pills containing mercury both in the metallic form and as chloride. The patient's diet is almost entirely limited to biscuits, dates, figs, and such like; while his ordinary liquid food is wholly withheld. Ptyalism occurs under this as under other modes of administering mercury, and doubtless in the use of that drug lies the value of the method.

The External Administration of Mercury.—The skin readily absorbs mercury when it is rubbed in in the form of ointment, or deposited as a thin coating of condensed mercurial vapour on the surface of the body. Both plans are extensively employed. Their main advantages are two. In the first place, when mercury is introduced through the skin, it is less apt to disorder the digestion than when it is taken into the stomach. Secondly, for success in either of these methods of treatment, the patient has to follow a regimen which of itself greatly advances his cure. His habits must be regulated to some extent, he must be at home at certain times for his vapour bath, or his inunction. He must keep his skin acting freely, and he passes more time in bed than he is disposed to do when he can avoid it. Both methods have the disadvantage of more or less interfering with the patient's ordinary avocations, and in the case of the vapour bath a special apparatus is required.

Inunction.—From a scruple to a drachm of mercurial ointment should be rubbed every night into some part of the body. The parts best adapted for rubbing are the inner sides of the arms and

[1] Tilbury Fox: Med. Times and Gazette. 1866, vol. i., p. 141.

[2] Shillitoe: Cases of tertiary syphilis treated by the Zittmann method, followed by the administration of large doses of iodide of potassium. Med. Times and Gazette. 1867, vol. i., p. 491.

[3] Benoit: De l'efficacité du traitement Arabique dans la Syphilis invétérée, &c. Gaz. Hebdom. 1860, Mai 4.

thighs, and the flanks. But if systematically carried out the whole surface should in turn receive its share. Lest local irritation arise, the patient should be cautioned not to rub in at the same place two consecutive times, but pass in rotation from one to another. Before commencing the inunction, the skin should be well cleaned by warm baths and soap, that it may easily absorb the mercury. The rubbing-in should be done before a fire, and the patient may apply it himself, though it is best done by an attendant whose hands are protected by a soft leathern glove, well soaked in clean fat to prevent its absorbing the mercurial ointment. The friction should be gentle, and continued for ten or twenty minutes. The patient should then go to bed, sleep in a flannel night-dress, and be well covered with bed-clothes to promote sweating. If he be restless or wakeful, he may take a draught of tincture of opium, with sal volatile or some other sedative. In the morning a warm bath of soap and water should be used before dressing. In this manner the mercury is quickly absorbed, and the skin is saved from irritation or soreness. The patient must frequently wash his mouth with a solution of alum, or other astringent. If the teeth are encrusted or decayed, they should be scaled, stopped, or removed before the mercurial course is begun. The diet should be light and nutritious, with wine or beer if the patient is feeble; if vigorous, a scanty diet is generally most advantageous. The bowels must be regularly evacuated by a saline purge from time to time if necessary. When the air is dry and warm the patient may take one or two hours' exercise out of doors; when cold or wet he should remain within the house.

The period necessary for one course is usually six or seven weeks. It is best then to discontinue the inunction for a few weeks and then repeat the course a second or a third time.

From the trouble necessary for its performance, inunction is generally reserved for obstinate relapses of the cutaneous eruptions, but especially for the cure of visceral disease of all kinds. Hairiness of the skin is an objection to inunction, as the hair follicles are apt to suppurate. Very fair complexioned persons also generally have tender skins, which readily get irritated and inflame. Mercurial friction, even when moderately employed, excites in some persons an erythematous or eczematous eruption which causes great annoyance, and is apt to spread over the whole of the surface to which the ointment has been applied.

Mercury can be applied to the skin in a way that is very often employed for children, viz., by smearing a drachm of mercurial ointment on a strip of flannel, which is worn as a belt round the waist or as a wrapper round the thigh. The ointment should be renewed

daily, and the skin washed from time to time lest it become sore. Some persons do not object to anointing the soles of their feet by spreading the ointment inside their socks.

The Oleate of Mercury has been tried for purposes of inunction,[1] but is not found to be generally useful. It is more irritating than the grey ointment, consequently more quickly causes inflammation of the skin—a property that is useful when local influence is mainly desired, but detrimental when long continued and constant absorption is requisite. The oleate acts more rapidly than grey ointment, and may be temporarily employed to hasten the disappearance of conspicuous patches on the face or other exposed parts of the body. There are three preparations used in pharmacy: the five per cent. solution, the ten per cent. solution, and the twenty per cent. solution; the first is a thin fluid, the third a thick jelly. If ten or twenty grains of the ten per cent. solution be rubbed into the skin for ten minutes, the oleate is completely absorbed, leaving no greasiness behind. After being thus applied during four or five days the gums usually become swollen and the eruptions begin to fade.

In the *mercurial vapour bath* an atmosphere of steam and mercurial vapour is produced, which deposits on the skin a thin coating of the mercuric salt. The patient, undressed, is placed on a wooden-seated chair, and covered with an oil-cloth or blanket supported by a hoop round the shoulders; the head is generally left out and the covering tied closely round the neck. The apparatus generally used is that known as Lee's bath. It consists of a lantern supporting a shallow saucer in the centre, surrounded by a deeper one; the first receives the calomel, into the second a little water is put. Beneath them is a spirit lamp, which is lighted, and the lantern is then put under the chair. In a few minutes the water boils and the mercury volatilises in vapour. The hot air and steam of the bath usually induce copious perspiration in ten minutes. After about twenty minutes the whole of the mercury has been volatilised, and the patient should then go to bed and remain between the blankets for an hour or two before dressing. For this reason the most convenient time for the bath is at bedtime. When this bath is first taken certain precautions are necessary. Some patients become faint when the steam rises, hence an attendant should remain in the room while the patient is in the bath. If perspiration be not readily produced, it may be quickened by sponging the body with tepid water before the bath, or the sitting may be prolonged to half an hour; but beyond this it is useless to continue the attempt to cause sweating. The debility and

[1] Berkeley Hill: Practitioner. 1873, vol. x., p. 204. Vajda: Wiener Med. Presse. 1874, Nos. 23 u. 24.

headache felt by some patients the day after the bath may be avoided by lessening the quantity of steam, and by shortening the stay in the bath. Henry Lee believes that the presence of steam renders the calomel fumes less acrid.

The dose and form of the drug vary with circumstances. When the disease is making rapid progress large quantities of mercury should be used, that the system may be quickly influenced. Thus Langston Parker, who largely employed this remedy, used the bisulphuret in one or two drachm doses for eruptions on the skin. For the mucous membrane of the throat and tongue the green iodide or calomel in scruple or half-drachm doses may be selected. The vapour of these two forms, being less irritating than cinnabar, can be inhaled readily. Mercury with chalk, the red oxide, the grey oxide, and the red iodide are also employed for this purpose. Henry Lee [1] prefers calomel, because its definite constitution allows the amount of vapour to be estimated. For other reasons also, calomel is an extremely useful form, and when used in doses ranging between twenty and sixty grains, it is not less active than the others in bringing the patient under the influence of mercury.

If the patient be strong and his eruptions widely spread, it is better to use large doses of calomel and a copious supply of steam. On the other hand, if he be feeble, and his disease of long standing, affecting the throat, bones, or testes, rather than the skin, the stay in the bath should be short, and the amount of steam and mercurial vapour moderate. The frequency of the bath also depends on the patient's strength; if he be vigorous, and the disease in its early general eruptive stage, he may take it every night until the gums swell—after this twice or thrice weekly is usually often enough; but if the patient be weak, or his disease of a late form, two or three times weekly are as much as he can bear. While taking the baths the patient is best at home in a warm room. But though advisable, it is not indispensable that he relinquish his ordinary employment altogether; he may pursue his business in the day and use the bath at night before going to bed, but he must clothe warmly when he goes out. He must also adopt a mild unstimulating diet, taking simple drinks freely, such as barley-water, linseed-tea, or decoction of sarsaparilla. The effect of the bath is not usually shown until three or four have been taken. Salivation is less often induced by the bath than by other modes of introducing mercury. It is, of all methods, the least disturbing to the patient's general health. Stomatitis is exceedingly rare, but slight diarrhœa is a not infrequent consequence of the baths; it is easily checked by simple means.

[1] Henry Lee: Lectures on Syphilis. 1863, p. 325.

Subcutaneous Injection.—This has been extensively employed by various surgeons. Scarenzio[1] in 1864 used calomel suspended in mucilage or in glycerine (0·20 of calomel in 1·0 of fluid) but, finding this proportion frequently productive of abscess, he diminished the amount of calomel (0·10 calomel to 1·0 of fluid). In 1865, Lewin of Berlin began a long series of injections with the perchloride, and in 1869[2] he published the results of his five years' experience, by which time he had treated a large number of patients. In 1876 subcutaneous injection had been for eleven years the method of treatment for nearly every case of constitutional syphilis which came into his wards at the Charité Hospital of Berlin, and he again announced his results.[3] It had been used upon at least 14,000 persons and only twenty abscesses of the cellular tissue had been noted. In this period Lewin himself injected 3000 patients among whom he met with only two abscesses. Liégeois[4] has made considerable trial of the perchloride in France. In eighteen months he made 400 injections. He found that four milligrammes (one-sixteenth grain) dissolved in two grammes of water (thirty minims) given daily in two injections, produced little local irritation and rapidly controlled the syphilitic symptoms. Owing to the pain and irritation (often abscess according to certain experimenters) that attend the injection of either perchloride or calomel, various other preparations of mercury have been tried.

A perchloride solution of four grains to the ounce of distilled water with the addition of seventy to eighty grains of chloride of sodium, was favoured by Sigmund[5] and others as causing less induration at the point of injection and as being speedily absorbed. Again, morphia and glycerine have been added to the perchloride solution with the expectation of diminishing the pain attending the injection, but without much result. The nitrate,[6] the bicyanide, the phosphate, and the acetate, have been employed one after the other with the object of preventing or of diminishing the coagulation of the albumen in the tissues at the site of the injection. Staub[7] proposed the solution of chloro-albuminate of mercury, and this form was extensively tried by Bamberger,[8] who however has supplanted it by

[1] Scarenzio : Bulletin de Thérapeutique. 1864, vol. lxviii., p. 379. Quoted from Annali universali di Medicina di Milano. 1864.

[2] Lewin : Die Behandlung der Syphilis mit subcutaner Sublimat-injection. 1869. See also Charité Annalen, Bd. xiv. 1871.

[3] Lewin : Berlin. Klin. Wochenschrift. Nov. 6, 1876, No. 45, p. 645.

[4] Liégeois : Gaz. des Hôpitaux. 1869, Aug. 3, p. 350.

[5] Sigmund : Neuere Behandlungsweisen, &c. 1880, p. 86 ; and by Krówczynski : see Vierteljahr. f. Derm. u. Syph., 1876, Heft 2. Also Hürbringer : Deutsches Archiv f. Klin. Med. 1879, Bd. xxiv., p. 129.

[6] Weisflog : Virchow's Archiv, Bd. lxvi., S. 311.

[7] Staub : Traitement de la Syph. par les injections hypodermiques. Paris, 1872.

[8] Bamberger : Wien. Med. Wochenschrift. 1876, Nos. 11 & 14.

a peptonised mercurial solution [1] owing to the speedy decomposition of the albuminate.

This peptonised mercurial solution (F. 73) has been employed by Sigmund and others, of whom Terrillon [2] has recently published an account of numerous cases thus treated. The general effects produced by this preparation, are identical with those following the injection of any other solution; but the local consequences are stated to be very unimportant, the pain being slight and the risk of abscess about the puncture very small.

In 1873, Ragazzoni [3] published an account of the results he obtained by employing a solution of the biniodide dissolved with iodide of potassium in distilled water. He injected eight to ten minims of this solution at a time, causing but little local irritation and speedily dissipating the symptoms. This solution has been tried and highly praised by others.

Besides its various solutions, *metallic mercury* has been subcutaneously injected by Hürbringer [4] about 200 times, in doses varying between one and three cubic centimetres. The only effect was to occasionally produce local abscesses in the pus of which metallic globules were present. The mercury caused no pain or salivation. The syphilitic symptoms remained unaffected. Mercury was not detected in the urine except in one or two cases where it had been suspended in emulsion before injection. These experiments confirm ancient experience that in the metallic form, unless finely divided, mercury is not absorbed into the circulation.

Our own experience in subcutaneous injection began in 1864,[5] and we first employed the bichloride dissolved in distilled water, using from six to twelve minims of fluid, containing from one-tenth to one-fourth of a grain. Since that time we have tried the bicyanide, the albuminised and the peptonised solutions of Bamberger, and most extensively the solution of biniodide of Ragazzoni. We have had the latter solution prepared with iodide of sodium; this salt having been found to be less irritating than iodide of potassium (F. 74). The effect of all the solutions is very similar. Pain and induration around the point of injection may attend the use of any of the preparations; perhaps least the solution of Ragazzoni; but none, certainly not the peptonised solution, are painless. Abscess rarely followed the introduction of small doses dissolved in a sufficiency of water (10–15 minims). In all our experiments the effect on the syphilitic

[1] Bamberger: Idem. No. 44.

[2] Terrillon: Bulletin et Mém. de la Société de Chirurgie. 1880, Nov. 5, p. 534. See also Petersen: Petersburger Med. Woch. 1879, No. 24. And Buzzard: British Medical Journal. 1878, Sept. 28, vol. ii., p. 475.

[3] Ragazzoni: Giornale Italiano delle Malattie veneree e della pelle. 1873, p. 65.

[4] Hürbringer: Deutsches Archiv f. Klin. Med. 1879, Bd. xxiv., S. 129.

[5] Berkeley Hill: Lancet. May 5th, 1866.

symptoms was rapid and the amount necessary to produce sponginess of the gums and fœtor of the breath in most patients was about the same, namely from eight-tenths to twelve-tenths of a grain. Owing to the effects of introducing mercury by this means being identical with those attending its introduction by any other channel (mouth, skin), and being no more than those methods, a security against relapses, subcutaneous injection should in our opinion be reserved for patients who fail to absorb mercury when given by the usual methods, or whose critical condition renders their immediate subjection to mercury desirable; *e.g.* in cases of severe affection of the eye, or brain, or other internal organ.

The mode of injection, to be successful with a minimum of pain, requires the observance of certain precautions. The syringe must be specially reserved for such cases, and be provided with a fine steel cannula, of which the point is frequently sharpened. The syringe must also be carefully cleaned with distilled water after every injection. The quantity of fluid to be injected is ten or twelve minims. A large bulk causes pain at once, while a concentrated solution is productive of greater hardening and aching afterwards. The amount of the mercuric salt varies between $\frac{1}{20}$ and $\frac{1}{5}$ of a grain, and two injections of $\frac{1}{20}$ each in twenty-four hours are less painful than a single one of one tenth of a grain. The solution should be freshly prepared and carefully freed from suspended solid matter by filtration before use. The part of the body where least pain is felt is the flank. The point of the syringe must always be carried carefully *through* the skin into the subcutaneous fat, or a slough or abscess will almost certainly follow the injection. The arms and legs, owing to their necessarily frequent movement are bad positions for the injections; nevertheless the ease with which they are uncovered renders them favourite localities for the operation.

The mischances which may follow the subcutaneous injection are various; the pain of the prick is too slight to be worth much consideration, (it can be completely prevented by the ether spray if desired). The pain that follows the coagulation of the serum in the locality of the puncture is sometimes severe. Circumscribed abscess and sloughing of the integuments about the puncture occurs sometimes, but the less frequently the more attention is paid to the precautions already mentioned: acute widely-spread erythema and swelling of the flank or limb are rare consequences. In one case we noted anæsthesia of the back of the forearm which continued for four days after an injection into the outer side of the left arm.

Iodine and its compounds.—There is much dispute concerning the influence of iodine in syphilis; some persons hold it to be as much a specific for the later affections as mercury is for the early

ones. This is erroneous; iodine often fails to cure *per se*, but in conjunction with mercury or other medicines it is the most valuable remedy we have for the late sequelæ of syphilis, though too frequently it only palliates them, and cannot be relied on as a lasting remedy. At the same time it is an error to suppose it acts only by rousing up the influence of mercury. Iodine is equally effective in persons who have not taken mercury if they are suffering from affections for which it is appropriate. Iodine alone does not assist in healing the initial manifestation, and is much less active than mercury in dispersing the early skin eruptions, or the relapses of lepra and other scaling forms of syphilide. It is proved to have value also in the early stages, through its property of dissolving mercury that has been deposited in the tissues and become inert. Melsens[1] has shown that after mercury has ceased to be excreted it reappears in the urine and other secretions, if iodide of potassium be given. So also mercurial salivation occurs in some persons when taking the iodide after a mercurial course.

In whatever form iodine is administered, it is quickly absorbed into the blood, and it may be detected in the several fluid secretions of the body very shortly after its ingestion. Adamkiewicz[2] has demonstrated its presence in the urine, saliva, sweat, tears, fluid from the Schneiderian membrane of the nose, pus of iodic acne, and milk of lactating women. By far the greater portion escapes in the urine speedily after it has been swallowed. The other secretions are only lightly charged with iodine and do not always contain it. In four or five days the iodine is wholly discharged from the system, unless very large doses be taken, when traces can be detected for several weeks in the urine. Iodide of potassium is absorbed and excreted without decomposition; nearly the whole of a given quantity of this preparation has been recovered from the urine of the person to whom it was administered.

The general action of iodine is to stimulate the kidneys, the skin, and the mucous membranes. It has been stated, though without any foundation for the statement, that the prolonged use of iodide of potassium will cause wasting of healthy glands, such as the breast and testis. In its ordinary action it is tonic, and increases the appetite. In syphilitic persons, according to Grassi and Keyes, it at first restores the number of red corpuscles in the blood; but large doses, if prolonged, produce a peculiar depression and languor.

Therapeutic Effects.—Iodine is chiefly beneficial in the later stages of syphilis. It is very useful in cases of tubercular eruption of the

[1] Melsens: L'emploi de l'iodure de potassium, &c. Paris, 1865.
[2] Adamkiewicz: Berlin Charité Annalen für 1876. Berlin, 1878, p. 381. He also quotes the researches of Bernard, Carus, and others.

skin, gummy swellings of the cellular tissue, rupia, affections of the muscles, bones, and viscera. In elderly persons and those in whom the cachexia is strongly marked, and in the affections of later childhood in inherited syphilis, iodide of potassium is almost always of great service. It often relieves with almost magical rapidity, headache, painful ulcers of the skin, throat, and other parts; and allays the nervous irritation produced by want of sleep or loss of appetite. A complete cure by iodine is not often achieved; most commonly the disease is simply controlled by the iodides, and breaks out again in a few weeks if they are discontinued.

Toxic effects. '*Iodism.*'—The deleterious effects of iodine are shown most commonly on the mucous membranes, beginning with coryza, pain in the frontal sinuses, congestion of the conjunctivæ and swelling of the eyelids, dryness and irritation of the fauces, and bronchitis. The œdematous swelling of the mucous membrane of the air-passages may be so great as to seriously interfere with respiration. Fenwick[1] relates an instance in which tracheotomy had to be performed on account of rapid œdema of the glottis, which supervened after the fourth dose of ten grains of iodide of potassium. Irritation of the alimentary canal is sometimes the chief symptom. The tongue gets dry and coated with white fur, though red at the tip and edges; now and then it may be tuberculated and fissured on the surface. Swelling of the tongue, stiffness of the jaws and salivation sometimes show themselves even when no mercury has been previously taken. Dryness of the throat, loss of appetite, irritation of the stomach, vomiting, and burning pain at the epigastrium, are more often complained of, while pain in the bowels and purging are not infrequent.

The skin may be the seat of various eruptions. There is an *erythematous* form which appears as bright red patches on the arms, which, if the iodide be continued, may become papular, but otherwise soon subside. Occasionally, at the flexures of the joints, the erythema becomes eczema. The patches are attended by a good deal of itching and smarting while they last. The commonest eruption is a papulo-pustular one, termed *iodic acne;* it appears most frequently on the face and backs of the forearms, though it may be scattered widely over the arms and legs. *Large tubercular pustules* are occasionally met with on the bridge of the nose and around the eyes. They are dull red, with a flat vesicle that presently dries to a scab and, falling, leaves the tubercle behind. We have seen them plainly umbilicated in some cases. These spots in their early stage may also have another resemblance to small-pox in being hard and shotty,

[1] Fenwick: Lancet, 1875, vol ii., p. 698.

with little pustulation. The tubercle is slow to subside and leaves a purplish stain or even, if it ulcerates, a depressed scar. This form of iodic eruption is probably that most often mistaken for a syphilitic one. *Boils* (true furunculi with a core) are also occasionally caused by iodine. There is a rare form of eruption, the bullous—*hydroa* as it has been termed by Hutchinson. In rare cases it occurs all over the body. In 1871 Bumstead[1] recorded a case where suddenly, within thirty-six hours after the first dose of iodide, bullæ, some one inch and a half across, developed on the back of the neck, face and backs of the hands. In some other examples[2] the vesicles had solid bases and contained a milky fluid. Their most usual size is between that of a pea and a cherry.[3] These several eruptions usually subside even without producing scabbing or scaling; but in severe cases where miscomprehension of the origin of the affection has caused the administration of the drug to be continued, the effects increase; the tubercles and pustules extend, break down into large spreading sores, and are attended by great prostration and wasting of the patient.[4]

Purpura is occasionally caused by the iodides. It occurs usually on the lower extremities. In fifteen cases noted by Fournier[5] the eruption was, with one exception, limited to the legs. It never went above the knee, and always spared the foot. All Fournier's patients were in fair health with no hæmorrhagic tendency. The character of the syphilis also was not severe. The spots are usually small and discrete, and they do not run together as in other forms of purpura. Colcott Fox[6] reports a case where the legs and forearms were the seat of the eruption; it was attended by itching and pricking of the affected parts. Fournier has once seen the eruption on the trunk alone. Iodic purpura is usually painless and often unnoticed by the patient himself. It disappears quickly on leaving off the remedy. The occurrence of the purpura does not seem to depend on the quantity of iodide prescribed nor on the state of the patient's health, but appears to be solely due to some idiosyncrasy on his part. Stephen Mackenzie[7] has recorded a remarkable case of a child, five months old, in whom purpura followed a single dose of two and half grains of iodide of potassium. In this case the erup-

[1] Bumstead: Amer. Journ. Med. Sci. July 18, 1871, p. 99. He also, in the edition of his Venereal Diseases of 1879, p. 815, notes that Dr. O'Reilly first recorded the occasional production of bullæ by iodide. New York Med. Gazette. Jan., 1854.

[2] Tilbury Fox: Clinical Trans. 1878, p. 40.

[3] Hutchinson: Clin. Trans. 1875, p. 151. See also Thin: Lancet. Nov. 16, 1878.

[4] Hutchinson: loc. cit.

[5] Fournier: "Du Purpura Iodique." Revue Mensuelle de Méd. et de Chirurg. 1877, p. 653.

[6] Colcott Fox: Brit. Med. Jour. 1879, May 31.

[7] Stephen Mackenzie: Med. Times and Gazette. 1879, vol. i., p. 173.

tion is stated to have appeared about three quarters of an hour after the administration of the drug, and the whole face quickly became swollen and of a purplish-black hue. The child was suffering from congenital syphilis and died sixty-eight hours after taking the first and only dose of the iodide. This author also mentions that he has seen circumorbital and subconjunctival hæmorrhage produced in one week by ten grain doses of iodide of potassium.

Eruptions may follow the administration of any preparation of iodide, but as the iodide of potassium is the salt most frequently used, so most of the recorded cases have been due to that particular drug.

The diagnosis of these eruptions is often important. Taken *per se* they have some resemblance to syphilides, but the polymorphism of syphilis is a valuable distinction: these iodic eruptions in most cases, depending as they do on the idiosyncrasy of the patient, quickly follow the first administration of the drug and continue so long as the medicine is taken, but subside rapidly when the iodide is withheld.

The *nervous system* is occasionally affected; its disturbance is shown by sensation of fulness in the head, singing in the ears, giddiness, spasmodic action of the muscles and impairment of their control, frequent pulse, sleeplessness, and wasting.

Albuminuria has been found by Overbeck [1] and others sometimes to attend the use of iodine or of its salts. Van Buren and Keyes[2] state that they have seen several cases of visceral syphilis in which a small quantity of albumen with casts appeared in the urine of patients who were taking large doses of iodide of potassium. These authors state that the albumen and casts may be made to disappear by reducing the dose of the drug. In connection with this subject it may be mentioned that Simon [3] found albumen in the urine of several children whom he was treating by the external application of a mixture of tincture of iodine and glycerine for scald head. Before the application, the urine was free from albumen, and it disappeared in a few days after leaving off the remedy, but returned when the iodine was again used.

The form of iodine most used is the iodide of potassium; but free iodine, and the iodides of sodium, ammonium, and iron, and iodoform are also employed. The great solubility of iodide of potassium renders it most conveniently given in solution. It is usually best to give it when the stomach is full, after meals. The amount to be given varies very much; when administered in the early stages of

[1] Overbeck: Mercur u. Syphilis. 1861.
[2] Van Buren and Keyes: Diseases of the Genito-Urinary Organs. 1874, p. 380.
[3] Simon: Allgemeine Wiener Med. Zeitung. 1876, Mai 16.

syphilis, or shortly after mercury has been discontinued, to increase or resuscitate the effect of the latter, the iodide may be given in doses of five to eight grains in two ounces of water once a day at night or by combining two or three grains with each dose of mercury (F. 37). When given alone, it is best taken three or four times daily with ammonia in a large bulk of liquid (F. 39). The quantity to be given depends on several circumstances; many persons can bear only a very small amount without experiencing the evil effects of iodine; others, again, are insensible to small doses, and must take a large quantity before any effect is produced. In most, if not all persons, the influence soon diminishes, and the same amount of action on the syphilitic affection can be secured only by frequently increasing the dose, or by omitting the use of the iodide for a short time. To persons unaccustomed to iodine, two or three grains of iodide are sometimes as effective as twenty or thirty to a patient who has long taken it. If the patient find no benefit from a moderate amount, as is often the case when the disease is of long standing, eight, ten, or twenty grains should be tried, or even much larger doses. Forty or sixty grains three times a day will sometimes quell an obstinate syphilide which has resisted smaller quantities, but larger doses than these may be required. The aromatic spirit and the carbonate of ammonia are excellent adjuvants; they not only serve to render iodide of potassium more active in persons growing accustomed to it, but they also increase the stimulant effect of the medicine in weakly persons. The addition of a few drops of Liq. arsenicalis to each dose of the iodide mixture sometimes relieves iodic acne; while for the prevention of coryza Hiron[1] recommends the addition of an equal quantity of nitrate of potash. If the patient be much enfeebled or debilitated, tartarated iron may be combined with the iodide (F. 41). Large doses of iodide can often be borne if dissolved in the compound decoction of sarsaparilla.

The iodides of sodium and ammonium are sometimes used as substitutes for the potassic iodide with advantage. Both salts contain, weight for weight, more iodine than the iodide of potassium, and the sodium iodide is in our opinion less depressing than the potassium iodide. The ammonium iodide on the other hand is really stimulating through the ammonia which it contains. For these reasons these salts may be used beneficially in weakly persons when very large doses are needed, and when, as in cases of epilepsy or other forms of cerebral disease, the dose of iodide must be repeated frequently in the twenty-four hours. The ammoniacal salt, having no fixed alkali, cannot hasten the disintegration of the red blood-

[1] Hiron: Med. Times and Gazette. 1877, vol. i., p. 355.

corpuscles in the manner soda and potassa are said to do. It appears probable also that the change from one salt to another is beneficial to patients who have to take iodine for long periods. The therapeutic effects and the doses of all the three salts are very similar in other respects. It must be recollected that iodide of ammonium is a very unstable salt, and some carbonate of ammonia should be prescribed with it to prevent its decomposition in the solution (F. 43).

Iodoform, the ter-iodide of formyl, is another preparation of iodine that has come into extensive use of late years. Though chiefly employed as an external application for syphilitic and local ulcers, it is also sometimes given internally. According to Lazansky,[1] the pharmacological use of iodoform was first tested by Rhigini in 1862, at the suggestion of Bouchardat, on account of its containing such a large proportion of iodine (90 per cent.). It is powerfully antiseptic, but it also affects syphilitic disorders similarly to other forms of iodine. Iodoform is unluckily also most irritant and stimulant, causing in many persons, nausea and heat at the epigastrium, even vomiting and purging if the drug be continued. If pushed far enough, it causes iodism and other signs of poisoning. It appears rapidly in the breath, giving a peculiar and disagreeable odour both to the air expired and to that eructated or passed from the stomach and intestines. Oberländer[2] gave a woman 630 grains of iodoform in eighty days. The patient was suddenly seized with faintness, vertigo, diplopia, and fell into a deep sleep, alternating with cerebral excitement and severe headache, delirium, and vomiting. She gradually recovered from this in fifteen days. A second patient fell into deep sopor after taking only five grains. We have tried iodoform in a large number of cases internally, but have found it tolerated by few persons. When tolerated, iodoform has cured obstinate fissures of the tongue and caused absorption of the superficial sclerosis on which those sores are seated. It has been also effective in controlling syphilitic neuralgia. In cases of extremity where other forms of iodine have lost their influence it is worthy of trial. It is best administered in the form of pills, and if washed down with barley-water or arrowroot, is more likely to be tolerated by the stomach. Rhigini explains this tolerance by stating that in the stomach the iodoform is decomposed into iodide of starch and iodide of albumen, the latter of which is soluble and quickly absorbed, while the former, being very little soluble, is inert. It is questionable if this explanation be true, as the iodoform appears as such in the breath un-

[1] Lazansky : Vierteljahresschrift f. Derm. u. Syph. 1875, p. 275. L. has collected the literature on the medicinal employment of iodoform from a large number of writers.

[2] Oberländer : Deutsches Zeitschrift f. Prakt. Med. 1878, No. 37.

changed, and can be recognised by its characteristic odour. But the advantage of giving the drug in combination with food is undoubted. The dose should seldom exceed a grain three or four times daily, and it is advisable to begin with half a grain (F. 69). Rhigini[1] indeed states that he has given, suspended in starchy fluids, as much as three grammes (45 grains) without evil result. The largest dose we have given has been five grains, and great disturbance of the stomach was caused by this amount. The local uses of iodoform will be described elsewhere.

The tincture of iodine has been given by some physicians, notably by Guillemin,[2] and also by Parrot,[3] for late affections of inherited syphilis. We have never found it to be tolerated in any dose large enough to be beneficial.

Iodide of iron is useful in debilitated patients, acting as a tonic, though very slightly in the peculiar manner of the other iodides. It is very effective in persons who have rupia, or ulcers of the skin, and well marked poverty of blood. In children it is also exceedingly useful, if given while they are taking mercury, or if they remain feeble after the syphilitic symptoms have subsided. Large doses of iodide of iron in rare instances produce eruptions similar to those that sometimes follow the use of other preparations of iodine. The syrup and the pills of iodide of iron are the forms in which it is administered.

The bromides of potassium and ammonium are used either in conjunction with iodide of potassium or alone. They are serviceable where the system has become insensible to iodine, or in syphilitic epilepsy and other varieties of nervous excitement (F. 40).

Donovan's Solution of mercury, arsenic and iodine is sometimes very effective in dispersing obstinate scaly syphilides. It is also useful in the late syphilitic affections of the tongue. (F. 77.)

Arsenic is sometimes given in the form of arsenious acid or Fowler's solution or as the arseniate of soda. Except in conjunction with mercury, as in Donovan's solution, we have not seen any decided benefit from its use.

Gold has long been occasionally given in syphilis. It has not been proved to have any real effect on the disease. Sigmund[4] after prolonged trials of the chloride of gold has never seen the slightest benefit from its use.

Iron is much used to restore the system from its anæmic condition, and is usually required at some time during the progress of a

[1] Rhigini : Journal de Bruxelles. 1862—63, Nos. 35 and 36.
[2] Guillemin : Annales de Derm. et de Syph. 1870—1, vol. iii., p. 339.
[3] Parrot : Gazette des Hôpitaux. 1879. No. 100.
[4] Sigmund : Loc. cit., p. 84.

case of syphilis. The tartarated iron can be given with iodide of potassium (F. 41). When taken by itself it often changes the aspect of spreading sores in debilitated persons with great rapidity. The perchloride of iron goes well with the perchloride of mercury (F. 35). Other forms of iron are used alone, or with the mineral acids, if general tonics of a non-specifie character are desired.

Cod-Liver Oil is often necessary for removing debility. In cases where neither mercury nor iodide of potassium can be borne, the patient will often regain his strength and ability to take more specific medicine, after the administration of cod-liver oil for a few weeks. When it is desirable to give mercury with the oil the two can be mixed, for the oil will dissolve an etherial solution of perchoride of mercury (F. 36). It will also dissolve sufficient iodide of potassium for the effect of each to be obtained. For instance, two scruples of iodide may be dissolved in eight ounces of cod-liver oil, and a tablespoonful taken three times daily.

Sarsaparilla is held in esteem by few physicians at the present day, though at one time it was the staple remedy in syphilis, and is still much relied on by the unlearned public. It is now given in combination with other vegetable extracts. We have found the liquid extract of sarsaparilla decidedly beneficial in enabling the patient to take larger doses of iodide than could be borne when dissolved in other menstrua. We have also found patients improve rapidly when sarsaparilla has been given while they were taking or had recently taken prolonged courses of mercury. In a few patients we have observed a beneficial effect from sarsaparilla alone, though nearly always in such trials its benefit has not been apparent. Very feeble or exhausted patients have, by gaining strength and flesh, become able to bear the action of the more specific drugs to which they were before unequal. Samuel Lane [1] and Clifford Allbutt [2] have written strongly in favour of sarsaparilla in tertiary syphilis. Sarsaparilla is largely used on the Continent in the form of decoctions, which, being drunk in large quantities, cause the patient to sweat freely, and there can be no doubt that in this way benefit results from its administration, though probably any other sudorific would be equally useful. It also enters largely into the Zittmann's decoctions already mentioned. If sarsaparilla be given at all, it must be in large doses. An ounce to an ounce and a half of the liquid extract per diem is better than a pint of the compound decoction, because in persons with feeble digestion the large bulk of liquid in the latter is apt to cause catarrh of the stomach.

Guaiacum, Mezereon, Saponaria, Lobelia, and many other vege-

[1] S. A. Lane: Lancet, 1873, vol. ii., p. 118.
[2] Clifford Allbutt: Practitioner, vol. iv., p. 257.

tables of a diuretic or diaphoretic quality, have been recommended in the treatment of syphilis, but they have either fallen into disuse or are of doubtful value. They are employed by some with the object of promoting perspiration while the patient is taking a course of mercurial vapour baths. There can be no doubt that free transpiration through the skin should always be encouraged in treating syphilis; but it is very questionable whether, by irritating and wearying the stomach with these large quantities of fluid, the patient does not often suffer more harm than he derives benefit from their sudorific action.

Tayuya, an extract of the Dermophylla pendulina, one of the Cucurbitaceæ, is stated to be used by a certain tribe of Indians in Brazil for the cure of syphilis. It has been tried by Pellizzari [1] in nine cases without the least effect in controlling the symptoms, whilst iodide of potassium had marked influence. Others, Faraoni and Sigmund for example, have tested tayuya with results similar to Pellizzari's. Geber [2] found a tincture of tayuya useful in checking the progress of syphilitic ulcers when applied locally; but the internal administration of the drug by the mouth or subcutaneously had no effect whatever on the general disease.

Jaborandi, and its alkaloid *pilocarpin*, have been employed in the treatment of syphilis by Lewin,[4] Lockwood,[3] Sigmund,[5] and others. The power of this drug to cause profuse sweating and flow of saliva, probably suggested its trial in treating that disease. Lewin employed it in several forms of syphilis, most of them being however cases of initial sore and early exanthem. He used pilocarpin in subcutaneous injections. Sigmund used the infusion of jaborandi and the subcutaneous injection of pilocarpin. Lockwood used it in two cases, one in conjunction with mercury, the other without mercury or other specific, both cases of copious scaly eruption. From the result of these experiments it is clear that jaborandi cannot be looked on as a specific for syphilis; yet by its diaphoretic power it may assist in producing the absorption of mercury during the inunction-cure through skins which are preternaturally dry. The drug may be given as an infusion, one drachm of the leaves in ten ounces of water, divided into two doses taken at short intervals. When given subcutaneously, as hydrochlorate or nitrate of pilocarpin, $\frac{1}{6}$ to $\frac{1}{4}$ of a grain is injected, and repeated twice if needed to produce perspira-

[1] C. Pellizzari: Practitioner, 1879, Oct., p. 289, quoting from Lo Sperimentale, 1878, No. 7. Bumstead and Taylor, loc. cit., p. 818, state that Dr. Nevins Hyde of Chicago gave tayuya a fair trial, and arrived at the conclusion that it had no effect in syphilis. These authors also cite a list of writers, mainly Italian, who have written on Tayuya.

[2] Geber: Vierteljahresschrift f. Derm. und Syph. 1879, p. 285.

[3] Lewin: Annalen der Charité für 1878, vol. v., p. 589. Berlin, 1880.

[4] Lockwood: Med. Times and Gazette. 1879, vol. i., p. 422.

[5] Sigmund: Neuere Behandlungsweisen, &c. 1880, p. 128.

tion. Lewin injected it daily for a period averaging thirty-four days in similar doses. No local reaction occurred, but severe collapse took place in four patients; endocarditis and hæmoptysis also occurred in one case. The profuse flow of saliva caused much distress in all.

Chaulmoogra, an oil expressed from the seeds of Gynocardia odorata, is much used in the treatment of rheumatism, leprosy, and syphilis, by native doctors of India, and has also been tried by Dr. F. T. Mouat[1] in cases of leprosy, scrofula, and secondary syphilis. We have tried it in a few cases of early general exanthem, scaling leproid, and ulcerating gummata of the skin. The only effect we have noted was to produce disgust and nausea in the patients; no benefit to their disease was afforded them by its use. It is now dispensed in perles, and in this form many of the disagreeable effects may be avoided.

Among the numberless drugs that have been vaunted of late years as remedies for syphilis may be mentioned *Carbolic Acid*, *Creasote*, and *Salicylic Acid;* of none of these have we any experience. Morgan[2] published some cases treated by creasote internally and by carbolic baths, in which he considered a beneficial effect was produced. Sigmund[3] states that he has given all three drugs a careful trial, but with no good result.

Opium is of great value in persons whose strength is worn out by protracted disease, by severe courses of mercury, or by debauchery, starvation, and drunkenness. In such cases, by the free use of opium sleep is obtained, the appetite returns, and obstinate ulcers heal. Opium is also necessary to allay the pain of iritis, periostitis, and other local affections, though in these cases its influence is usually more decided if given in conjunction with iodide of potassium and mercury.

Sulphur in the shape of natural sulphurous waters has long been highly valued at Aix-la-Chapelle, Aix-les-Bains, and other bathing-places which possess such springs. Güntz[4] and Bertier[5] have investigated the action of sulphur, and state that it assists the elimination of mercury from the tissues and prevents its accumulation, and consequently is a useful adjuvant in the treatment of syphilis. Some experiments made by ourselves with the sulphide of calcium given internally in obstinate cases of syphilis, in conjunction with mercury and iodide of potassium, have seemed to confirm these statements. But they have been too few and undecided in their

[1] Mouat: Indian Annals of Medical Science: and Lepage's Essay on Chaulmoogra, to be obtained of Messrs. Corbyn and Co., Druggists, High Holborn, who also can supply the pure oil.
[2] Morgan: Medical Press and Circular. Jan. 12, 1870.
[3] Sigmund: Loc. cit., pp. 77—78.
[4] Güntz: Neue Erfahrungen über Behandlung der Syphilis. Dresden, 1878.
[5] Bertier: Spas of Aix-les-Bains and Marlioz. London, 1877.

effect to lend much support to the theory that mercury is prevented by sulphur from being stored up. The researches of Vajda and Paschkis[1] on the elimination of mercury show that our knowledge of the unaided power of the body to eliminate mercury is too imperfect to allow us to estimate the value of sulphur as an adjuvant in that process. Indeed Güntz himself ascribes no little value to the mud-bath in effecting the clearance of mercury without the intervention of sulphur at all.

The treatment of syphilis at certain continental bathing-places, Aix-la-Chapelle and Aix-les-Bains for example, consists in the employment of the natural sulphur water as a diaphoretic and adjuvant to the special treatment of the disease; while at other baths, Ofen in Hungary and Arcena in Spain for example, diaphoresis and purging without specific treatment are trusted for curing the disease.

The system pursued at Aix-la-Chapelle is perhaps the most celebrated and most successful. Its main features are as follows:— The patient is restricted to a tolerably precise regimen which excludes bodily fatigue, excess of all kinds, and enforces regular hours of rest and gentle exercise. The diet is limited; many articles of diet, such as fruit, likely to cause laxation of the bowels are forbidden, while milk is largely prescribed. The daily course consists of a bath in the hot sulphur water, and during the sweating thus induced, a drachm of mercurial ointment is rubbed by an attendant into the skin of the patient. In this condition he remains for one or two hours, drinking a pint or more of the sulphur water during his sweat. He then rises, walks out, dines, and then walks again if weather permit. In the evening he goes early to bed and thus prepares himself for a repetition of the treatment next day. Great care is taken to prevent salivation both by watching the effect of the treatment on the patient and by insisting on the use several times daily of an alum or other astringent mouth-wash. Tonics are also administered to weakly persons, and the treatment is modified in its strictness to suit their condition. The course occupies usually six or seven weeks, comprising forty to fifty rubbings. In this time all symptoms have usually disappeared, at least for a time, and the patient is dismissed by his physician with an injunction to return again for another course after an interval of two months.

There can be no doubt that great benefit is derived by submission to a course of treatment similar to that just described. One reason, and probably the only one, why those who have failed to get relief elsewhere are cured at a bathing place is that the patient who has decided to go abroad for the special purpose of being cured, has

[1] Vajda and Paschkis: Loc. cit.

great faith in the treatment to which he is subjected and therefore observes its regulations punctually. Strict compliance with the necessary rules and submission to the restriction essential for the absorption of the mercury necessary for his case is not often compatible with his engagements or pursuits at home. Such and such only, in our opinion, are the advantages of migrating to a bathing resort for the cure of any form of syphilis. Their complete cure can be procured at home equally well if the physician be as careful in directing his patient, and his patient as attentive in carrying out his instructions as are both doctor and patient at Aix-la-Chapelle, or at Aix-les-Bains.

Special Treatment of the Affections of Syphilis.

Many consequences of syphilis require special applications both to relieve pain and to check the mischief that results from the morbid action on the part affected. Most of the affections of the surface of the body can usually be healed by local applications alone, but there is much probability of their return, or of some other syphilitic affection succeeding them, if the activity of the virus be not overcome by simultaneous general specific treatment.

The Syphilides, or Affections of the Skin.—*Roseola.* Very little local treatment is necessary for the early forms of eruption, which commonly cause no discomfort. Sometimes if the rash spread rapidly, it itches a little. Soap and water usually allays this very well, but the patient may apply a little cold cream or vaseline while the irritation lasts. Roseolous blotches on the face or neck may be painted with oleate of mercury and morphia (F. 52) or a little rice starch or other simple cosmetic may be applied.

Papular and Scaly Syphilides.—The early papules do not usually require local applications unless they are on the face or other conspicuous part of the body. Their disappearance may be hastened by the application of oleate of mercury (10 per cent.), but this sometimes causes a considerable amount of smarting, in which case the oleate with morphia may be used, but it is not so effective. In the later papular and tubercular eruptions also the oleate may be applied, but then requires to be rubbed in instead of being merely applied to the surface. Patches on the forearms or hands may be still more rapidly cleared away by the injection of solution of mercury into the cellular tissue beneath them.

For fissures and cracks of the skin especially about the lips, nose, or ears, calomel cream is a useful application (F. 56).

In the papulo-scaly eruptions of the palms and soles (Psoriasis palmaris and plantaris) the itching and smarting are relieved by an

ointment of red oxide of mercury (F. 54) or of zinc and mercury (F. 53). The ointment should be well rubbed in at bed time, and gloves should be worn during the night. The application of mercurial plaster also often answers very well in these cases. Painful fissures may be painted with mercurialised collodion (F. 75).

Severe cases in which an abundance of thick horny cuticle with deep fissures is developed on the sole may be well treated in the following way:—Every night at bedtime soft soap is freely spread over the sole and a bandage applied. The foot remains bound up until the morning, when the soap is washed away and dilute nitrate of mercury ointment or grey ointment applied. The patient then puts on his socks over the ointment and wears it during the day. In the evening the soft soap is again applied, and the whole process is repeated daily until the hard cuticle has been cleared away; after which the tender surface may be dressed with the ointment alone until the sole has recovered its healthy condition.

Mucous Patches must be well washed, dried, and dusted with a powder of calomel and oxide of zinc (F. 71) several times daily. Care must also be taken to arrange strips of lint or rag so that opposed surfaces are kept apart. This is especially necessary when the patches are on the female genital organs or between the toes. If mucous patches ulcerate freely or become prominent and fungating, the application of dried sulphate of zinc will often check their progress at once. Solid nitrate of silver or acid nitrate of mercury is also often very beneficial in such cases, as is also carbolic acid or a strong solution of perchloride of mercury.

Ulcers of the skin may arise from the breaking down of papules or may be a consequence of pustular syphilides in cachectic persons. In later syphilis rupia is the most frequent cause of ulcers on the skin, but they are also frequently produced by the breaking down of tubercular syphilides and subcutaneous gummata. All these varieties of syphilitic ulcer require careful cleansing at least twice daily, after which they may be dusted with powdered iodoform, or dressed with an ointment of the red oxide of mercury, or of zinc and mercury, or dilute nitrate of mercury. In rupia the scabs require softening with oil and poultices, and after their removal the sores may be dressed with finely-powdered iodoform or the iodo-carbon paste (F. 58) and covered with dry lint; or each ulcer may be covered with a piece of mercurial plaster. If the ulcers spread rapidly or become phagedænic, and iodoform fail to arrest their progress, the acid nitrate of mercury, or a strong solution of nitrate of silver (F. 78), may be carefully applied and followed by warm-water dressing. When the ulcers are large and very numerous, as in cases of early malignant syphilis, immersion of the patient in warm water

as described in the chapter on 'Chancre' may be tried. A lotion of tartarated iron (F. 27) and the same salt given internally with iodide of potassium or mercury, are also very effective in these cases.

If the ulcers are indolent and languid, a strong solution of tannin, or the tartarated iron lotion, or a solution of sulphate of copper should be used.

Deep tubercles, when breaking down into phagedænic sores, or large ulcerating tubercles or sinuses may sometimes be usefully scraped away with Volkmann's spoon or destroyed with Paquelin's cautery. But no gumma should ever be opened. Under general treatment they may be always rapidly absorbed, and if no breach of surface be produced the subsequent scar, if not altogether prevented, is much diminished in size.

In extensive syphilitic ulcers, skin-grafting may be resorted to in the same way as in ulcers from other causes. Reverdin,[1] Coulson,[2] and others have published cases of tertiary ulcers successfully treated in this way. Dron[3] has employed skin-grafting in a case of widely spread initial ulcer of the penis.

When *the hair* falls, it is well to prescribe a wash (F. 26), to satisfy the patient that something is being done to restore the hair, though it returns readily if constitutional treatment be carried on.

Cracks and ulcers about *the nails* are relieved by binding them with strips of mercurial plaster, or lint spread with red oxide of mercury ointment. They may also be painted with solution of perchloride of mercury in collodion (F. 75).

The Alimentary System.—*Mucous patches* of the mouth and throat may be touched with nitrate of silver every other day, or they may be painted with glycerine of carbolic acid or tincture of iodine. An astringent gargle must also be used several times daily.

Ulcers of the mouth should be touched every other day with nitrate of silver, and the mouth washed with a solution of alum frequently, especially after eating, to clear away fragments of food. Obstinate ulcers of the fauces are quickly relieved by a gargle of perchloride of mercury (F. 4). A solution of permanganate of potash (F. 22), is also excellent as a wash for the mouth. When the gums are spongy a solution of acetate of alum (F. 2) or glycerine of tannin must be used frequently. Ulcers at the side of the tongue are often kept up by being chafed against ragged teeth; these must be filed or removed. The pain of sinuous fissures of the surface is much relieved by dropping into them with a fine brush, a

[1] Reverdin: Archives Gén. de Méd. 1872, vol. i., p. 299.
[2] Coulson: Lancet. 1871, vol. ii., p. 887. See also cases quoted by Callender: Lancet. 1870, vol. ii., p. 708.
[3] Dron: Annales de Derm. et de Syph. 1874, vol. v.

solution of nitrate of silver strong enough to destroy their surface and cause a small eschar. The acute inflammation of the fauces that sometimes accompanies the ulcers is relieved by inhalation of steam from a jug of hot water, to which a tea spoonful of the compound tincture of benzoin has been added. Lumps of ice in the mouth ease the dryness and pain of this, as of other inflammations. Spray inhalations of various kinds may be used with great benefit when the ulcerative action has spread over a considerable extent of the fauces and pharynx. One grain of sulphate of zinc or a quarter of a grain of perchloride of mercury to an ounce of water is useful for this purpose. Iodoform pastilles (F. 60) are recommended by Whistler in these cases. Careful mopping of the surface of spreading ulcers with a caustic solution of chloride of zinc destroys the surface and greatly lessens the pain caused by swallowing and speaking. The inhalation of mercurial vapour from the ordinary moist vapour bath is also sometimes beneficial.

When *necrosis of the bones of the palate* has occurred, and the fragments are loose, they must be removed with forceps, and the mouth frequently rinsed with solution of permanganate of potash, or chlorinated soda (F. 23). After all the dead bone has been removed, and the parts have cicatrised, an artificial palate is a very great comfort to the patient. Plastic operations for the remedy of gaps are rarely successful owing to the highly contractile character of the cicatrix. Most surgeons agree with Fergusson[1] that it is better to close the opening by an obturator. Salter[2] recommends that the obturator should be applied as soon as the dead bone has come away and while the wound is in a state of granulating activity, and remarks that it is surprising how the granulations will then stretch across the upper surface of the obturator and close the orifice. The same surgeon also remarks that in neglected cases, a granulating condition may be revived by frequently scarifying the edges of the perforation, care being taken to return the obturator to its place after each scarification. When the perforation involves the hard palate only, an arch of metal or other hard substance nicely applied to the contiguous palatal surface is sufficient; but when it involves also the soft palate to an amount that cannot be remedied by operation, the addition of an elastic flap or soft palate is necessary. In many patients, when the perforation of the palate is of moderate dimensions, a sufficient obturator may be fashioned by fastening together with a stitch at the centre, two disks of soft india-rubber, rather larger than the gap to be closed. The patient soon learns the knack of slipping one of the disks from the mouth through the perforation

[1] Sir W. Fergusson's Practical Surgery. 1870, p. 530.
[2] Salter : Holmes' System of Surgery, 2nd edition, vol. iv., p. 393.

into the nose, where it at once springs to its full size. Thus, one disk being in the nose and one in the mouth, the communication between the two cavities is closed. The obturator should be taken away at night to be cleansed.

Surgical procedures for the division of strictures of the fauces and pharynx have in some cases been successful in obtaining a permanent widening of the passages from the mouth and nose to the gullet and larynx. The strictures may become extremely narrow, before the patient applies for relief. In West's case,[1] the aperture had the size of a small pea; in Bradley's[2] case it was equally small; in Tobold's[3] case it admitted a fine sound only, and in Gilbart Smith and Walsham's case[4] it had the diameter of one-eighth of an inch. Any operation for enlarging the passage should always be preceded by tracheotomy and time allowed for the patient to become accustomed to the tracheal tube before the stricture is divided. In the case treated by Walsham the first incisions were made with a Ricord's urethrotome. Hilton[5] has reported a case where for want of the preliminary tracheotomy, the patient died of suffocation through blood being sucked into the air-tubes.

In the Œsophagus the ulcers and stricture that follow them require the food to be bland and nourishing. If the stricture is narrow, the occasional passage of a bougie will relieve the patient's sufferings. But in some few of the cases on record the contraction has been due to the thickening of gummy deposit rather than to cicatricial contraction; so the assiduous employment of specific treatment must not be omitted even though bougies produce no alleviation of the dysphagia.[6] Gastrostomy has been performed by Maury[7] and Bryant[8] as a last resource.

Affections of the rectum and anus.—Ulcers at the *anus* are very troublesome and intractable. They require laxatives to promote speedy and easy passage of the fæces, and careful washing and dressing with iodoform, while calomel ointment (F. 55) or the iodo-carbon paste (F. 58) is applied to the excoriated mucous membrane of the outlet. While this local treatment is pursued, general specific remedies

[1] West: Lancet. 1872, vol. ii., p. 291.
[2] Bradley: Lancet. 1872, vol. i., p. 82.
[3] Tobold: Deutsche Klinik. 1874, p. 206.
[4] Gilbart Smith and Walsham: Lancet. 1880, April 17, vol. i., p. 604.
[5] Hilton: Lancet. 1872, vol. i., p. 82.
[6] Godin reports a case (Pacific Med. and Surg. Journal, 1875), where well-marked symptoms of tight stricture were so completely relieved by iodide of potassium that a bougie passed easily which before had been impossible, and the act of swallowing became fairly rapid. See also Luton: Jaccoud's Nouveau Dictionnaire de Méd. et de Chirurg. pratiques. 1879, tom. xxiv., p. 394, for another case in which a very narrow stricture of the gullet was speedily dispersed by iodide of potassium and a lasting cure obtained.
[7] Maury: Amer. Journ. Med. Sci. 1870, April, p. 365.
[8] Bryant: Habershon's Diseases of the Abdomen, 3rd ed. 1878, p. 73.

must be assiduously administered. Ulcers within the rectum may be treated by iodoform suppositories (F. 84), and astringent injections. Great care must be observed in regulating the action of the bowels, and suitable general treatment must also be carried out.

In Ano-Rectal Syphiloma, when the affection is in the stage of infiltration, or before contraction has made much progress, the proliferation may be checked or, according to Fournier and Zappulla, the new tissue may be even absorbed by prolonged administration of iodides. But this rarely happens, because the patient seldom applies for treatment until contraction has become considerable. When it has fairly set in, the treatment is only palliative. Of the general treatment, the most important provisions are the regulation of the bowels, the daily use of enemata, and the occasional administration of purgatives; articles of food which leave but a small amount of débris, such as milk and eggs, are to be the chief food. The local treatment consists in maintaining the patency of the strictured portion by means of bougies, passed as often as is requisite to prevent much shrinkage. Should the contraction be too great to permit of bougies being passed without causing severe suffering, or be too narrow for them to pass at all, the stricture must be divided, and its subsequent re-contraction prevented by the passage of bougies. The operation most in favour is the so-called 'linear rectotomy.' Verneuil, Gosselin, and Guèrin in Paris, and Allingham in England, have employed it with good results. One method consists in entering a trocar and cannula at the margin of the anus, carrying it in the cellular tissue between the coccyx and sacrum and the rectum until the point of the trocar is higher than the strictured part; the trocar is then made to penetrate into the gut. The cannula being left in position, the trocar is withdrawn and replaced by a wire, the hooked end of which is seized by long forceps and drawn downwards through the stricture until the chain of Chassaignac's écraseur can be attached to its end. This is made fast and the wire with the cannula is withdrawn; thus the end of the chain is carried above and outside the stricture, of which forcible division can then be made. The edges of the wound at the anus are lightly cauterised when the division is complete. If, as often happens, there be a fistula running upwards exterior to the rectum, Verneuil makes use of this in introducing his chain. Allingham[1] uses a long straight knife for dividing the parts, and states that the bleeding is but trifling if care be taken to cut exactly in the median line. Trélat[2]

[1] Allingham: Diseases of the Rectum. 3rd. Edit., 1879, p. 233.
[2] Trélat: Le Progrès Médical. 1878, 22 Juin.

has recently operated by carrying a platinum wire loop above the stricture, and then dividing it by the galvanic cautery.

In a case recently operated upon by myself, the wire écraseur was employed with excellent result.—B. H.

The general treatment of the affections of the alimentary organs depends mainly on the condition of the patient, and the length of time that has elapsed since infection. If he is in good health, and in a comparatively early stage of his disease, mercury should be administered at once, and continued until all symptoms are removed. The vigour of the patient must be restored, and his general health maintained according to the suggestions already put forward. Many of the late affections of the throat and of the liver and spleen appear in persons who are extremely anæmic. For these iodide of potassium in gradually increasing doses, iron, and cod-liver oil are requisite. Careful attention must be paid to the diet that it be stimulating and nutritious; and the patient should be sent to a mild winter climate, such as Bournemouth or Torquay. When the health is recruited by these means, small quantities of mercury may be added to the iodide, for example, one-twelfth of a grain of the perchloride three times a day; or the vapour bath or inunction may be combined with the internal administration of iodide of potassium. Either of these external modes is generally better borne than the internal use of mercury. In all cases where the affection does not yield speedily to iodide of potassium, it is advisable to try the effect of mercury, in whatever condition the patient may be, though in extremely feeble persons the experiment must be made cautiously. Whichever method of treatment is found to succeed should be continued for some months, and in the case of visceral disease, until the patient is in sound bodily health. The treatment should in all cases include a prolonged course of mercury to be begun as soon as the patient's strength will permit. The best result often requires an occasional resort to specific remedies to check a tendency of the disease to return.

The Air Passages.—The fœtid discharges of *the nose* require frequent cleansing with a dilute solution of chlorinated soda by means of the nasal douche (F. 23); tincture of iodine much diluted with water also checks the fœtidity and amount of the discharge very greatly. If any of the bones of the nose have become necrosed, the discharge will continue till the dead bone has come away; but syringing four or five times a day with some disinfectant, will prevent fœtor. The syringe for this purpose should have a long nozzle, that the current may be easily directed to the affected part. But the nasal douche answers better than any syringe.

When the sequestrum is detached or almost so, and ulcerated patches of the mucous membrane maintain continuous fœtid discharge, the cure may be expedited by removal of the necrosing masses. But careful exploration with the rhinoscope and with the finger in the pharynx is needed before any attempt to move the mass is made. Volkmann's sharp spoon is a suitable instrument to use when scraping away the granulations [1] and extracting the sequestra of bone; the latter, however, may generally be removed with the forceps without much difficulty.

Bougies of iodoform and gelatine (F. 82) are also sometimes serviceable in reducing the fœtor and discharge from the meatuses. They should be inserted morning and evening at first, then, as the discharge diminishes, in the evening only.

Follicular ulcerations and chinks within the alæ nasi are to be treated by keeping them constantly soft with red oxide of mercury ointment (F. 54) applied with a camel-hair pencil.

All the affections of the nose and air passages are much aggravated by exposure to keen winds, hence a respirator will greatly relieve the patient's suffering. During the winter, residence in a mild Southern climate is desirable.

In the larynx, the spasmodic irritation caused by the ulcers in chronic inflammation is relieved by benzoin or creasote inhalations (F. 5), and if the sores can be seen with the laryngoscope, by brushing them over with a strong solution of nitrate of silver. The inhalation of an atomised solution of perchloride of mercury (1 in 500 or 1000) is recommended by Demarquay, Schnitzler, and others. Dyspnœa and chronic irritation are often relieved by applying a small blister to the throat, and dressing it with diluted mercurial ointment. Œdema of the larynx sometimes takes place during the exanthematous stage of syphilis, and it may be very rapid. Dyspnœa of sudden onset and rapid increase is usually speedily relieved by large doses of the iodides given at short intervals; for example, twenty grains of iodide of ammonium every four hours. When the dyspnœa is slowly produced and is due to cicatricial contraction, specific remedies have usually but little influence,[2] and tracheotomy becomes necessary. In cases where a web forms in the larynx it may sometimes be divided. Elsberg [3] has successfully used the galvanic cautery for this purpose. Morell Mackenzie [4] remarks that the success of treatment depends mainly on the density of the web; if it be thick and

[1] Schuster: Vierteljahresschrift f. Dermat. u. Syphilis. 1878, p. 211.

[2] For a useful summary of the causes and varieties of syphilitic dyspnœa, Trélat's paper (Bulletin de l'Académie Imp. de France, Séance du 8 Dec., 1868) may be consulted. See also Krishaber: Annales des Mal. de l'Oreille, du Larynx, &c. 1878 and 1879.

[3] Elsberg: Loc. cit.

[4] Morell Mackenzie: Diseases of the Throat and Nose. 1880, vol. i., p. 364.

tough, treatment is seldom of any avail. In cicatricial stenosis of the larynx dilatation by tubes should be had recourse to.

When *the trachea* is contracted, there is little to be done beyond the administration of large doses of iodide of potassium and careful regulation of the diet and habits of the patient.

Syphilitic disease of *the lung* requires the same treatment as other kinds of phthisis, with the important addition of iodide of potassium in large doses and of mercury in prolonged courses.

The Bones.—The pain of early nodes is benefited by spirit lotion, or solution of iodine (1 of iodine to 6 of spirit), and still more by blisters. Puncture of the node is always to be avoided, as the fluid is speedily absorbed when specific treatment is employed. When the bone is necrosed and laid bare, the part must be frequently washed with solution of permanganate of potash, and when the necrosed portion is loose, it should be removed with forceps. The chronic induration that accompanies syphilitic caries is often exceedingly slow. Nevertheless, only such tissues as are already necrosed, and exciting by their present continuous discharge, should be removed; scraping with sharp spoons, cauterising and otherwise attacking living tissues is rarely beneficial, and attempts to clear them away by the knife or gouge often set up further mischief.

Affections of the Muscles and Joints as well as those of the bones are most readily controlled by iodide of potassium given in slowly increasing doses, and continued for a considerable time; small quantities of mercury being added as the patient's strength will permit. If permanent shortening remain, tenotomy may be requisite.

The Nervous System.—Iodide of potassium and tonics, with an occasional stay at the sea-side, should be employed from time to time. Bromide of potassium is especially useful when syphilitic disease of the brain causes epilepsy, both by allaying the irritation, and also possibly by rendering the influence of the iodide more energetic. It should be given with iodide of potassium and carbonate of ammonia (F. 40). But here, as in all other cases of visceral syphilis, mercury must be given in prolonged courses, that is, for nine or twelve months after the urgent symptoms have been dispelled.

In cases of coma or epileptiform convulsions or other severe form of derangement of the brain it is imperative to bring the patient under the influence of specific remedies as speedily as possible. To this end twice or thrice in the twenty-four hours Ragazzoni's solution of mercury (F. 74) should be injected subcutaneously, while every three or four hours 15 to 20 grs. of iodide of ammonium should be administered. When the subcutaneous injection of mercury has produced symptoms of ptyalism, or marked improvement

of the patient shows that the urgency has passed away, the frequency of the doses must be diminished, or the subcutaneous injection may be replaced by inunction, performed daily by a skilled rubber. Adjuvants to the treatment are attention to the digestive organs, the supply of nutritious food, the relief of pain by anodynes, and perfect quiet.

By perfect quiet is intended complete rest for the brain, especially for that part of the organ which is apparently most affected. For example, in cases of aphasia, conversation and even speaking must be very limited. The patient must be cautioned not to struggle with his difficulties of thought or speech, but to await their gradual restoration. All kinds of excitement, such as frequent visits of relatives and friends, loud noises, or business worries, must be avoided. In short, the treatment of syphilitic cerebral disease is that proper to other forms of cerebral disease, *plus* most persevering employment of anti-syphilitic remedies. A year at least must be passed before mental occupation beyond light amusement be undertaken.

The Spinal Cord.—The special treatment of the syphilitic affections of the spinal cord is very limited in its application. These disorders are most benefited by long continued courses of the anti-syphilitic medicines. Counter-irritation of local areas of hyperæsthesia by blisters is occasionally useful to hasten the disappearance of symptoms of meningeal irritation, and presumably of conditions of congestion or hyperplasic thickening. Careful abstention from nervous excitement and muscular fatigue during the early stages is of great importance. Prolonged exertion of any kind and sexual intercourse must also be strictly forbidden.

The treatment of the *limited paralyses* which are so frequent in syphilis is comprised almost wholly in the general treatment of the disease. It is seldom necessary to employ any local remedy. When the nerves are slow to resume their function, a weak continuous electric current may be directed along their course with the object of stimulating their activity. But such procedures are rarely necessary or useful.

The Eye.—Sores and mucous patches of the *eyelids* should be kept scrupulously clean and dressed with red oxide of mercury ointment or powdered with calomel and oxide of zinc. All loose lashes should be removed.

Keratitis.—Mercury should always be given. Two or three grains of grey powder with as much Dover's powder, twice a day, is generally well borne by the patient; or twenty grains of mercurial ointment with an equal quantity of vaseline may be rubbed in every day, or spread on a flannel band, which is to be constantly worn round the

belly. The diet should be generous, with plenty of milk. Iron, quinine, and cod-liver oil are also of great benefit, especially when the child is feeble. Locally, a solution of atropine (F. 81) should be used three or four times a day until it can be ascertained whether iritis be present, and a large shade should be worn. If there be severe ciliary irritation, the patient should be kept in a darkened room and atropine used frequently. Warmth to the eyelids also gives much relief. For this purpose the application of heated pads of cotton wool is often better than fomentations (Nettleship). Iridectomy is occasionally necessary but does not always succeed; neither does counter-irritation give such good results in this affection as in chronic ulcers of the cornea. Local stimulation of the cornea by yellow oxide of mercury ointment or calomel dust appears to be useful in hastening the absorption of the residual opacities.

Iritis.—The treatment of syphilitic iritis is of great importance, from the rapidity with which irremediable mischief is sometimes caused. It is true that the inflammation can be controlled in many cases without mercury; indeed it may subside naturally even when left entirely to itself, but of course with great risk of permanent injury to the eye. Atropine locally and mercury internally should always be prescribed. Blue pill and opium (F. 63) should be given every four or six hours till the gums begin to swell, when the dose must be reduced or given only once or twice in the twenty-four hours. In an urgent case subcutaneous injection may be employed. A strong solution of atropine (F. 80) should be dropped into the eye every hour or every two hours till the pupil is well dilated or until no further effect can be produced on it. Afterwards a weaker solution (F. 81) may be used three or four times a day. The eye may also be kept bound up with warm belladonna lotion (F. 28). Opium is often necessary either in the form of Dover's powder or of solid opium; when the pain is violent, subcutaneous injection of morphia may be employed. Three or four leeches to the temple also give great relief in such cases. In rare instances when the iritis does not yield to other treatment iridectomy is necessary. In the late forms of iritis iodide of potassium alone or combined with mercury in some form will be required.

Choroiditis and Retinitis.—In these affections constitutional treatment is of the greatest importance. A dark room is also beneficial. Mercury should be given to keep the gums slightly tender for several months. The more severe cases require more or less continuous treatment by mercury or iodide or both for a year or even much longer. When there is much pain, repeated leeching is useful. In cases that come under treatment during the exudative stage rapid

improvement of sight is often obtained, but is not always permanent; and in estimating the effects of remedies, the natural tendency of the disease to remissions and exacerbations must be remembered.

The Ear.—Ulcerated papules or mucous patches of the external ear require similar treatment here as in other situations. When seated around the external meatus they must be frequently cleansed, dried, and dressed with calomel and zinc powder. The ear should also be syringed daily to get rid of the discharge which flows inwards from the patches.

When the middle ear is affected the treatment is that of catarrh from other causes. The condition of the throat should in these cases always be examined and any lesions of the pharynx that may be present should be promptly treated.

In affections of the internal ear general treatment by mercury and iodide of potassium must be carried out. In the deafness produced by affections of the internal ear in inherited syphilis Hinton [1] found the chloride of ammonium in twenty-grain doses serviceable in some cases.

The Generative Organs.—The treatment of *syphilitic testis* is the same as that for other late forms of constitutional syphilis. When the testis is enlarged by gummy inflammation long after infection, the patient is frequently extremely debilitated and emaciated. To these persons iodide of iron, cod-liver oil, and other remedies for invigorating the system must be administered, and in the mean time the patient must take some anti-syphilitic remedy,—iodide of potassium is most commonly efficacious, if given in gradually increasing doses three or four times daily. This generally suffices to remove all enlargement in the course of eight or ten weeks. In the mean time the patient must not neglect to improve his general health by good diet and other means. Syphilitic sarcocele returns or attacks the second testis so constantly when iodide of potassium is alone given, that it is desirable always to prescribe mercury as well. It is well borne in solution with iodide of potassium (F. 37). Inunction of twenty to sixty grains of blue ointment into the skin every night is also a very good way of introducing mercury in these cases. With regard to local treatment; the testes should be well supported by a bandage, but other applications are seldom required. Some surgeons use stimulating applications to the scrotum, such as iodine, and other ointments, in the belief that the absorption of the morbid deposit is thereby promoted. They have little value compared with continuous internal treatment and are very apt to cause troublesome soreness.

[1] Hinton: Holmes' System of Surgery. 1870, vol. iii., p. 322.

Fungous protrusions as well as ulcers are occasionally produced in syphilitic sarcocele, from the destruction of gummata of the investments or of the testicle itself. For both forms of fungous granulation constitutional treatment is most essential, and for those which originate in the investments, simple local treatment, with astringent lotions, is all that is needed. In true hernia testis the granulations may be removed by elastic ligature; or astringent or semi-escharotic applications, such as red oxide of mercury, dried sulphate of zinc and the like, may be applied, and straps of adhesive plaster arranged so as to support the parts and prevent fresh protrusions. It is seldom prudent to excise the granulations owing to the facility with which they are reproduced. In most cases the general anti-syphilitic treatment checks the growth of the granulations, after which they retract within the scrotum and cicatrisation takes place.

For the affections of *the uterus* the local treatment is of extreme importance. The local remedies are chiefly those beneficial to the non-syphilitic affections of the uterus; they are described in the concluding chapter of this work. But constitutional treatment with iodide of potassium and mercury is indispensable when the patient is the subject of syphilis. Mercury may be given by the mouth in the ordinary way, or by introducing it through the vagina. The mercurial suppository (F. 85) may be passed every three days into the vagina against the os tincæ; or a pencil-shaped bougie of the same material may be introduced into the cervix. When the uterus is enlarged and indurated, this method is very useful, combined with iodide of potassium taken by the stomach. Habits of scrupulous cleanliness and frequent injections are especially necessary. When syphilitic eruptions of the uterus are present, an alum or borax injection should be used twice daily, while constitutional treatment is pursued also.

Treatment of Inherited Syphilis.

Treatment of Pregnant Women.—The remarkable power of mercury to nullify the influence of the virus in syphilitic parents has been already described in Chapter II., and Löwy[1] has still more precisely tested it in his experiments with mercurial inunction in pregnant women. He has recorded the results of pregnancy of ninety-nine syphilitic women in the General Hospital of Vienna. Thirty-nine women were subjected to a regular course of inunction, while by the remainder no systematic mercurial treatment was

[1] Löwy: Wiener Med. Wochenschrift. 1869, No. 39.

undergone. Of the women treated, living children were born in 75·6 per cent. Of those not treated, decomposed fœtuses were born in 76 per cent. This contrast needs no comment.

Lewin[1] and others have also combated the belief, at one time entertained, that mercurial treatment of the mother was liable to cause abortion.

It being generally agreed that all women who have borne syphilitic children, or who in their own persons show symptoms of syphilis, should be regularly treated with mercury throughout their pregnancy, it remains to describe the methods best adapted to the end in view. The inunction cure is troublesome, and, provided some form of mercury can be absorbed when taken internally, there is no reason for adopting inunction. But owing to the frequent dyspeptic or gastric disturbance which affects pregnant women, it often happens that mercury administered by the mouth is not absorbed. In such cases, no delay should be allowed to occur in arranging for a course of inunction. This should be sufficiently energetic to cause slight symptoms of ptyalism for three months continuously. When mercury has been absorbed for this length of time the treatment may be intermitted for a month and then resumed in a milder form until the termination of gestation. Thus, during the first course twenty to forty grains of grey ointment should be rubbed in daily, or on alternate days, while in the second course ten or fifteen grains will usually suffice. Meanwhile, the precautions ordinarily requisite in pregnancy must be scrupulously adopted.

Treatment of the Child.—After birth there are two indications to be fulfilled: first, to sustain the child's power of nutrition while under the influence of the malady: second, to attack the poison by specific remedies. To carry out the latter indication is oftentimes the surest way of promoting nutrition, for in proportion as the virus loses ascendancy the child regains health and strength. Mercury should always be employed. It can be given in two ways, either indirectly through the mother, or directly to the child itself. This latter plan is so much more efficacious, that it must always be selected, if the child's strength will permit, and it very rarely cannot be adopted. For indirect administration the mother must be mercurialised for several months while suckling the child. Part of the mercury, dissolved in the milk, enters the child's system in quantity occasionally sufficient to check his disease and save his life. But there is much uncertainty in this mode; the mercury is often not secreted with the milk. Cullerier and others have found it altogether absent on several occasions when testing the milk of mercurialised women.

[1] Lewin: Die Behandlung der Syphilis mit subcutaner Sublimat-injectionen. 1869.

When human milk has not been obtainable, goats and asses have been mercurialised in order to store their milk with mercury for the child fed upon it. Pèligot failed to detect any mercury in the milk of the animals so treated. These uncertainties render indirect treatment objectionable, and if the mother is given mercury at all, it should be solely for her own benefit.

The direct administration of mercury to the child is commonly carried out by giving him mercury with chalk. Twice daily he should take a grain of grey powder with a little sugar; but the effect upon the bowels must be carefully watched, and the dose diminished or combined with a grain of compound ipecacuan powder, if any diarrhœa or colic come on. As soon as the symptoms are evidently improving, the dose may be diminished, and half a grain taken night and morning. If the symptoms are not affected by this small quantity of grey powder, the dose may be cautiously increased in frequency; but a larger amount is very likely to produce purging, and is not often necessary, as every requisite effect is generally secured by the smaller dose. Solution of corrosive sublimate in doses of one-thirtieth to one-twentieth of a grain given with a little syrup or new milk three times daily is used on the Continent. Calomel in doses of one-sixth to one-half of a grain is also employed; but the extreme irritability of the bowels in children renders neither of these forms of mercury so good as grey powder, and they are little employed in this country. Mercury applied *externally* to children is less likely to cause diarrhœa than when given internally. It may be done by spreading fifteen to thirty grains of mercurial ointment diluted with its weight of lard or vaseline on a piece of flannel which the child wears constantly round his waist. The ointment should be renewed on the flannel every night; and the child's skin ought to be carefully washed with soap and water every third or fourth night before the flannel is replaced. Rubbing the ointment into the skin is also practised, and mercury is very safely introduced by this means, though there is some risk of irritating the skin by friction. Another method is to bathe the child twice daily in a solution of perchloride of mercury of about one-sixth of a grain to the ounce of water. This is more uncertain than inunction, and, according to Diday, sometimes produces a sudden and violent erythema of the surface of the body.

Besides mercury, other medicines may be usefully employed. The syrup of the iodide of iron often stimulates nutrition in feeble children without having much direct influence over syphilis. Cod-liver oil may be given with good effect; ten or twenty drops to a teaspoonful twice or thrice daily, midway between meals. The solution of perchloride of mercury in cod-liver oil (F. 36) is very

useful for infants. Iodide of potassium is also beneficial. It may be given to the mother, as it constantly appears in the milk of persons taking it. It can also be given to the child dissolved in water or milk.

Iodide of potassium is most valuable in the tardy forms of syphilis or in children who have been submitted to long courses of mercury. The rules for its employment in children are the same as those for its administration to adults, but the doses are of course smaller.

The length of the period of treatment should be at least six months, and during the greater part of this time mercury should be given.

Hygiene and Local Management.—The several local affections that occur in children require similar treatment to that prescribed for adults. Certain of them are more frequent in infants, and of much greater importance. For example, catarrh of the air passages and bronchitis are the most frequent sources of death in syphilitic children. Hence it is of extreme importance that the child should be carefully guarded against cold, live in airy, well-warmed rooms, and be taken into the open air only when the weather is dry and sunny. The child must be kept perfectly clean, the napkins replaced by clean ones as often as they are soiled, and the parts sedulously washed and dried. Mucous patches should be dried and dusted with calomel and zinc powder. Crusts of pustules should be well smeared with lard, and then poulticed with bread and water. The crust thus softened should be gently removed, and the ulcer kept moist with ointment of red oxide of mercury, or iodoform oil (F. 79). Chinks between the fingers or around the nails should be protected by covering them with strips of rag smeared with dilute mercurial ointment.

One of the greatest difficulties with syphilitic children is the nasal catarrh, which hinders sucking, and is so constant a symptom. It must be managed by beginning mercurial treatment as early as possible, to check the inflammation of the mucous membrane. The nostrils must be cleared regularly of inspissated mucus with a camel-hair pencil dipped in water, and excoriations touched with the ointment of red oxide of mercury. The fauces should be examined, and ulcers in that situation touched with solid nitrate of silver. The mouth must be carefully cleaned after each meal with warm water and a small piece of sponge on the end of a stick; excoriated surfaces and aphthous patches being touched with solution of borax or hyposulphite of soda.

Management of the Diet.—Whenever the mother can suckle her child she should always do so, as the proportion of suckled infants who recover is very much larger than of those who are fed by hand. The risk of communicating syphilis will of course render it impos-

sible to employ any but a syphilitic wet-nurse. If such a nurse can be obtained the child will probably thrive better on her milk than by any form of artificial feeding. Fournier[1] and others strongly recommend the goat as a wet-nurse, and advise that the child should suck the milk direct from the goat's teat. Parrot[2] states that this method has been tried several times at the *Hôpital des enfans assistés* in Paris without much success. When these resources are not available, hand-feeding must be trusted to entirely when the mother has no milk. The meals must be given at stated intervals, every two, three, or four hours, according to the age. The child must not be allowed to overcharge his stomach, which, if he be feverish, his thirst will induce him to do. The quality of the food fit for the child varies very much with his condition, and thus requires much careful management. As weak or exhausted children frequently die rather of inanition than of the effects of the disease itself, and as the milk of syphilitic women is often very poor or scanty, the child's food should be supplemented with two meals of cow's milk, or still better, ass's or goat's milk, to which a third or fourth part of veal or chicken broth may be added, with a little sugar. If the cow's milk be very rich, plain water may be used occasionally instead of the broth. It is important that the same cow should always furnish the milk, and that she be fed on hay or grass, not on turnips, grains, &c. The milk should not be boiled, but warmed by mixing it with hot broth or water, or by placing the bottle in hot water for a short time. When the child is fed on milk chiefly, a small quantity at a time must be given, and one part of lime water instead of plain water, mixed with three parts of milk; farinaceous food must be allowed very sparingly, one meal a day if the child is more than three or four months old. But Mellin's Extract is far preferable, and can be digested by most children, even the feeblest. Emaciated children will sometimes bear a few teaspoonsful of cream with sugar and lime water, when milk is rejected or keeps up diarrhœa. A few teaspoonsful of moderately strong beef-tea, with pounded biscuit, are also useful once a day. Older children require more solid food, and in addition to the milk they will take small meals of sop of biscuit flour, the yolk of an egg lightly boiled, or beaten up in a little veal broth or beef-tea.

If the child be very feeble, brandy may be given in small quantities, fifteen or twenty drops in water, three or four times a-day. The brandy should be mixed with sufficient water to prevent it from burning the mouth. Children who have nearly completed their

[1] Fournier : "Nourrices et Nourrissons Syphilitiques." Paris. 1878, p. 23.
[2] Parrot : Gazette des Hôpitaux. 1879, Aug. 30.

first year can often take raw meat, and after the first few times wil often do so with avidity. A piece of rump-steak, carefully cleare of fat, should be scraped into shreds with a knife, or pounded in mortar. The meat should be freshly prepared, and may be give four times in the twenty-four hours, about two teaspoonsful at eac meal. If the child refuse the meat, he may often be induced t swallow it by rolling it into pellets and putting them in his mouth or mixing it in his milk or beef-tea. Older children will often ea it, if spread between two thin pieces of bread and butter. But th child soon gets to relish the meat better than any other food, an this diet generally checks diarrhœa very efficiently when that i present. If the milk be thrown up, or the abdomen be distende with flatulence soon after suckling, wrapping the belly in a hc napkin while the child sucks, and keeping a roll of flannel on cor tinuously, will often check the vomiting, and enable the stomach t digest the milk.

DIVISION III.

CHANCRE.

CHAPTER I.

Synonyms.—Soft, simple, local, non-infecting chancre or sore; Chancroïde (Clerc); Chancrelle (Diday); Schanker.

Definition.—Chancre is a virulent contagious sore which is never the beginning of syphilis. It is produced only by inoculating the pus of a similar ulcer either on the patient himself or on another person. It may be reproduced as a local disorder a great number of times; but this number varies in different people. In most cases, probably in all, the power of reproducing the sore is, after a time, temporarily lost.

General Sketch.—Respecting the nature of the virus which produces the local chancre, authors are not agreed: some maintain for it a connection with the poison of syphilis; others look upon it as pus in an unusual condition of acridity, being in some way elaborated into this state by inflammatory processes. Thus, chancrous pus may be developed *de novo* according to this view.

Another view maintains the dependence of chancre upon a separate morbific poison, propagating itself whenever it is planted in a suitable locality, and reproducing itself equally well whether inoculated upon healthy or diseased persons.

This is the view which is most in harmony with known facts respecting chancre. Its distinctions from syphilis have been already discussed in the chapter on 'Diseases confounded with Syphilis,' and the differences useful in diagnosis will be found further on. That the pus of chancre does not owe its virulence to the effects of inflammation on ordinary matter is tolerably well proved by its pre-eminently contagious character, a character that is not removed from it by great dilution; also by its being equally operative in healthy as in inflamed tissues. Other kinds of pus,—indeed most kinds,—are capable of producing pustules, or even ulcers, if inoculated under

certain conditions. But this faculty compared with that of chancrous pus is weak, and soon becomes exhausted.

Auspitz and Pick[1] and Bidenkap[2] experimented with the pus of pemphigus, acne, scabies and lupus. They inoculated from such matter through several generations on syphilitic persons, but failed when they tried the same experiment on non-syphilitic patients. Others who followed them were more successful, and showed that the presence of syphilis in the person on whom the experiment was made was no more indispensable than a venereal origin for the matter used in inoculation. Kaposi[3] produced generations of inoculable sores on their bearers as well as on other non-syphilitic persons with the pus of eczema, scabies, and acne, exactly similar in their course and duration to the series which Pick, Bidenkap and others evolved on syphilitic persons.

Vidal[4] found in inoculating the pus of ecthyma on its bearer that one third of the cases were successful when the pus was taken from a pustule in full activity. Wigglesworth,[5] who was suffering from ordinary acne, inserted the matter taken from one of the acne pustules into his left fore-arm at three places. From the pustules thus produced he repeated his inoculations to second and third generations, thus having nine pustules on his arm at one time. Zeissl, under whom Wigglesworth was then studying, showed the arm to his class to prove the possibility of producing ulceration from simple healthy pus, when properly inoculated. Wigglesworth at the time of the experiment was a little run down from overwork, but was free from actual malady of any kind, and from specific infection past or present.

Some years ago when syphilisation was under discussion, I carried out some experiments to ascertain what difference existed between the inoculation of venereal and non-venereal pus. The general results of these experiments satisfied me that in some persons artificial inoculation could be carried on with facility; while in others, it was difficult to excite a series of inoculable sores. I succeeded well with venereal pus; but with pus from other sources I seldom succeeded beyond the third series. I never produced a typical chancre from anything except chancrous pus.—B. H.

The question has yet to be decided what confers on the discharge of the local chancre its pre-eminently irritating character. This is certainly much greater than that of pus drawn from any other source, whether of syphilitic or non-syphilitic origin. An explanation that

[1] Auspitz: loc. cit., p. 335.
[2] Bidenkap and others, quoted by Zeissl: Virchow und Hirsch's Jahresbericht für 1865, Bd. ii., S. 490; and in a letter to B. H. of March 18, 1866.
[3] Kaposi: Syphilis der Haut, &c. 1873, p. 47. Also Reizung und Syphilis. Viertelj. f. Derm. ü. Syph. 1879, p. 278.
[4] Emile Vidal: Annales de Dermatologie et de Syphiligraphie, vol. ix., p. 329.
[5] Wigglesworth: Bumstead and Taylor: "Venereal Diseases." 1879, p. 29.

has been offered is that debility or exhaustion of any kind may engender such a condition of the individual, that if he be accidentally wounded and the wound be irritated by dirt or other matter, inflammation of a destructive character follows. The products of this inflammation would thus be so intensely irritating that when implanted on a wound, they would excite therein a process of destruction similar to that going on in their source. This theory of the nature and origin of the local chancre is the one approved by Bumstead and Taylor,[1] but it does not explain all the clinical characters of chancre. They are, in our opinion, best accounted for by regarding chancre as a distinct morbid entity, called into being by its own virus, and propagating its species by the inoculation of its secretion, and distinguished from all other diseases by its course, symptoms, and terminations.

Under the microscope the discharge of chancre presents no characters by which it can be distinguished from ordinary pus; but it is doubtful whether the contagious principle exists in the serum as well as in the pus cell. Rollet[2] filtered chancrous pus through tissue paper, and inoculated the serum that percolated through the paper, but without success. This would lead to the inference that, in this as in some other diseases, the active principle is contained only in the cell.

Great dilution with water does not destroy the contagious power of chancrous pus, though to what extent such dilution may be carried is not exactly known. Boeck[3] states that he found a mixture of one drop of pus in 100 drops of water still inoculable. Further, Puche is said to have produced chancres with one drop of pus mixed with half a glass of water.

If the pus be allowed to dry in the air its vitality is apparently soon lost. Bumstead[4] found inoculation unsuccessful with pus that had been kept only twenty-four hours. Sperino,[5] on the other hand, is said to have had success with pus that had remained on a lancet for seven months. When sealed up in vaccine tubes, Boeck found the matter become inert when more than five days old. Ricord, however, employed with success pus which had been preserved in tubes for seventeen days. These discrepancies indicate that some condition not yet appreciated, besides mere exposure, operates in destroying the activity of the virus. As regards the effect of temperature, Boeck found that prolonged freezing of chancrous pus, as also its exposure to a heat of 104° Fahr., rendered it

[1] Bumstead and Taylor: Venereal Diseases. 1879, p. 31.
[2] Rollet: Maladies Vénériennes, 1865, p. 223.
[3] Boeck: Andersoegelser Angaande Syphilis. Christiania. 1875; and New York Med. Journal, November, 1877.
[4] Bumstead and Taylor: loc. cit., p. 342. [5] Sperino: quoted by Rollet, loc. cit., p. 57.

inert. Alcohol, acids, and alkalis, as well as other chemical reagents, also destroy its activity. Of these Boeck found corrosive sublimate and glacial acetic acid most destructive. Putrefaction and gangrene also destroy the activity of chancrous pus. From the foregoing it is clear that the poisonous essence is readily destroyed, though we cannot precisely fix all the conditions under which it loses its vitality.

Contagion.—It is improbable that contagion ever takes place through an unbroken surface, for though it is conceivable that the discharge may be absorbed if allowed to remain long in contact with a delicate mucous membrane, there is no absolute proof that absorption really does occur in this way. Paget,[1] it is true, when speaking of dissection poisons, asserts that a breach of surface is not essential for the absorption of chancrous matter; but he adduces no direct evidence to support his opinion. Strongly opposed to this belief are two facts which plainly show that a breach of surface is, at all events, usual; namely, (1) the favourite sites of chancre are just those localities where abrasion is most frequent; and (2) escape from contagion where there is no breach of surface is constant.

The immunity of the sound mucous membrane is well shown by the experiments of Cullerier and others to be presently noticed.

Some experiments made by Jullien[2] also strongly support the view that a breach of surface is necessary for absorption by the skin. That physician rubbed chancrous pus well into the skin of the anterior surface of the thigh with the pulp of his finger: in some cases this rubbing was even carried so far as to remove the superficial layer of the epidermis, in others the surface was epilated before the application of the chancrous pus, but in no single instance was a chancre produced.

Modes of Contagion.—As in syphilis, so in chancre, contagion may be direct or mediate. Propagation of chancre, however, occurs almost solely during sexual intercourse; obviously because, being a local disease, it does not give rise to general lesions about the mouth and elsewhere, which, in the case of syphilis, are not infrequently the means of propagating that malady.

Mediate Contagion may occur in many ways—for instance, by the use of unclean instruments,[3] towels, and other articles that have been in contact with the discharge of chancres; but the almost

[1] Sir James Paget: Clinical Lectures and Essays. 2nd edit., 1879, p. 332.

[2] Jullien: Maladies Vénériennes. 1879, p. 307.

[3] With regard to this point Bumstead (speaking doubtless of his own country alone) makes the following remarkable statement:—"After the operation for phimosis in our venereal hospitals, the wound is not infrequently inoculated by the use of cutting instruments, *serre-fines*, sponges, or towels, smeared with chancroidal pus." (Bumstead and Taylor: loc. cit. p. 344.)

invariable limitation of chancre to the genital organs and their immediate neighbourhood renders mediate contagion by such means a much more rare occurrence than in syphilis.

Under this mode of contagion come also those instances in which disease is conveyed from a first person to a third through the medium of a second who escapes. Puche[1] relates the case of a young man who had intercourse on his wedding-day with a woman suffering from chancre, and shortly afterwards with his wife. The latter contracted chancres while the husband escaped. The man in this case had a long prepuce, and he had not washed himself after the first coitus. Another and similar case has been recorded by Ricord.

To ascertain the possibility of this mode of contagion, Cullerier[2] made the following experiments. He selected a woman in whom the vagina was free from excoriation, and passed into it some chancrous pus which he left there thirty-five minutes. He then took some of the pus from the vagina and inoculated it on the patient's thigh; he afterwards carefully washed the vagina with alum water. The inoculation of the thigh succeeded, but the vagina completely escaped contagion. This experiment was also tried with a similar result on another woman in whom the pus was left undisturbed for nearly an hour. Tarnowsky[3] of St. Petersburg repeated Cullerier's experiments with the same success.

Tarnowsky also performed the following experiments with the *syphilitic* virus, on two women who had never had syphilis, and in whom the vagina and external genitals were free from abrasion. In the first case he deposited in the fossa navicularis some of the discharge taken from an indurated primary sore. In the second case the discharge from a mucous patch was employed in the same way. The matter in both instances was left undisturbed for thirty-five minutes. The parts were then carefully washed with a weak solution of potash and dried with charpie. One of the women was kept for two, and the other for four months afterwards in the hospital, but in neither case was any sign of syphilis discovered. These experiments tend to show that a breach of surface is equally necessary for syphilitic inoculation as the preceding experiments show it to be for the production of chancre.

Individuals vary in susceptibility to contagion; this depends to some extent on the conformation of the sexual organs, and on the degree of tenderness and delicacy of the epithelium covering them, possibly also somewhat on idiosyncracy or the susceptibility to irritation which

[1] Puche: quoted by Jullien, loc. cit., p. 308.
[2] Cullerier: quoted by Fournier. Leçons sur le Chancre par Ricord, p. 369.
[3] Tarnowsky: Vorträge über Venerische Krankheiten. 1872, p. 55.

varies in different individuals. Observers who practise repeated inoculations of chancrous pus ('syphilisation') find some persons much more apt to receive the contagion than others. Bidenkap[1] says this susceptibility varies much at different times in the same subject. Lindmann[2] states that he successfully inoculated himself more than two thousand times with the pus of soft chancres, without exhausting his capability of exciting a pustular ulcer. According to Boeck, in most persons the skin loses its susceptibility to ulcerate after inoculation has been continued for three or four months, but regains susceptibility again in course of time. Hübbenet,[3] however, met with two individuals in whom inoculation always aborted. The susceptibility varies also in different parts of the body; the thighs are more irritable than the trunk, the genitals probably most so of all. Again, the irritant quality of the secretion depends greatly on the period of the sore's existence; when a sore has lasted a long time, inoculation of its secretion often fails, though the activity can generally be restored by irritating the sore again to suppuration.

Relative frequency of Chancre.—This varies greatly from many causes. Mauriac[4] examined the records of the Midi Hospital of Paris from the year 1837 to the year 1875, with the following results. Up to 1860, the entries for chancre greatly surpassed those for syphilitic sore. In 1861-3, this relation changed so much, that in the latter year the infecting sores were more numerous than the local ones. Thenceforth, until the end of 1871, the local chancre became again more prevalent. Afterwards, the infecting sore in its turn increased in frequency, until July 1875; when it was ten times more numerous than the local ulcer. Horteloup[5] has brought this comparison down to the end of 1879, by which time the local ulcer had for a third time become by far the more numerous.

Mauriac also obtained statistics, through Dron and Jullien, from the Antiquaille Hospital of Lyons for a long series of years, which showed variations similar to those observed in Paris. In our own country trustworthy statistics are not easy to obtain. At the Plymouth Naval Hospital,[6] during the years 1861-4, 1,634 cases of ulcer were under treatment; and of these, 1,140 were independent of constitutional syphilis. Thus, nearly 70 per cent. were local sores. In the year 1870, there were under the care of Mr. Berkeley Hill, at the London Lock Hospital, 1,873 venereal patients: of these, 217 had primary syphilitic sores, while 138 had local chancres.

[1] Bidenkap: Aperçu, &c.
[2] Lindmann: quoted by Fournier: Leçons par Ricord, p. 335.
[3] Hübbenet: die Beobachtung und das Experiment in der Syphilis, S. 11. Leipsig. 1858.
[4] Mauriac: Rareté actuelle du Chancre Simple, &c. Paris. 1876.
[5] Horteloup: Annales de Dermat. et de Syph. Janvier, 1880, p. 54.
[6] Beith: Evidence before the Committee on Venereal Disease in the Army and Navy. 1865.

In Liverpool,[1] of 945 cases admitted into the Lock Hospital of that town in the two years ending May 31st, 1877, 331 suffered from syphilitic sores, and 169 from local chancre. Again, at the Male Lock Hospital of London during the first quarter of 1881, 581 men were treated as out-patients; of these, 161 had syphilis, and seventy the local chancre. These data are not sufficient for estimating the average relative frequency of the two venereal sores; but they nevertheless indicate that the syphilitic sore far out-numbers the local ulcer at the present time. Probably the relation varies much in all countries and all large towns, as the statistics of Mauriac show to have been the case in Paris and Lyons. This proportion is influenced by several causes, such as social position, personal habits, and the disturbance that follows war and other political changes. Of these influences the most powerful are connected with the personal habits of the people. For instance, dirty people are more likely to contract disease than those who are cleanly in their person and habits. Again, men who consort with old prostitutes contract the local chancre more frequently than syphilis; while those who seek the society of younger women of loose character, and clandestine prostitutes, are more likely to catch syphilis. Of this fact the explanation doubtless is that the old prostitute has generally suffered from syphilis so long before, that her constitutional disease is no longer communicable. A young woman, on the contrary, is much more likely to be suffering from syphilis in a communicable form.

Description of Chancre.—There is no period of incubation in simple chancre; the effects of the inoculation begin to show themselves without delay, and pass immediately through phases of development which are most typically evolved when the inoculation has been artificially practised. The same absence of delay is noted, whether the matter of a chancre be inoculated on the patient who bears the sore (auto-inoculation), or whether the discharge be brought from another person (hetero-inoculation), or whether it be brought from one of the lower animals on which the chancre has been artificially produced. Some effect, such as a pustule or minute round ulcer, can always be detected in twenty-four or, at the latest, forty-eight hours after the matter has been introduced.

In experimental inoculation the following effects are observed: in the first twenty-four hours the puncture, which is usually covered by a minute scab, reddens, and a small areola is formed; on the second day the red spot swells, and the areola enlarges; on the third day the swelling is surmounted by a vesicle of which the contents, at first clear, soon become opaque, and the pustule is

[1] Lowndes: Brit. Med. Jour., Dec. 1, 1877.

complete. This pustule is usually flattened on the summit, sometimes even slightly depressed, or umbilicated, in the centre. Boeck finds that the chancre usually secretes inoculable pus by the third day, though at this time the pustular stage is only just reached. The fluid increases till about the fifth day, when the pustule bursts; the discharge then dries, and forms a crust or scab of a brownish colour. If this be removed, an ulcer is seen with the following characters: its depth varies a little, but rarely extends beyond the thickness of the skin or mucous membrane on which it is situated. Its circumference is circular, the margins are sharply cut as if by a punch, and generally somewhat undermined. By means of a lens slight notching of the border can be seen; this is due to an unequal progress of the destructive action. The floor is uneven and spongy, hence called wormeaten, and is covered at first with greyish green tenacious matter, but afterwards a plentiful secretion of pus takes place. The base of the sore is a little thickened by congestion, and the whole is surrounded by a narrow areola.

Anatomical Structure.—If a section of a chancre be examined under a low power of the microscope, the horny and Malpighian layers of the epidermis surrounding the sore are seen to end abruptly at the point where the ulceration begins. The anfractuosity of the chancre appears on section as a hollow (like the crater of a volcano); this hollow is limited by granulations, the tissue of which is directly continuous with that of the hypertrophied papillæ around the margins of the chancre (Cornil). The minute anatomy of the chancre does not differ from that of other lesions due to inflammation and ulceration, and therefore need not be given here. The points of difference between the initial lesion of syphilis and chancre have been noticed in the chapter on Diseases confounded with Syphilis.

In cases of accidental contagion, as seen in practice, the course of events differs considerably from that just described. There is often seeming delay in the appearance of the sore after inoculation, because the amount of irritation is too small to attract attention; wherefore the patient will often be confident there has been nothing to be seen for some days after contagion, and there is often for four or five days no excoriation or vesicle, but simply a little redness. Clerc[1] recites a case where he remarked this preliminary reddening on the prepuce two days before the ulcer appeared. When the ulcerating action has commenced the sore reaches its full development in a few days, and while in this stage the aspect or variety of the sore is determined.

Varieties of Chancre.—When a chancre has existed for about a

[1] Clerc: Maladies Vénériennes, p. 173.

week, it commonly reaches through the whole thickness of the skin or mucous membrane; its form is sometimes circular, but often irregular, and its size varies from that of a pin's head to that of a large bean. The borders of the sore are sharply cut or eaten away and undermined. The floor is not hardened nor covered with the diphtheritic exudation so common on the syphilitic sore, but is concealed by a viscid pus; when this is wiped off, the surface is seen to be pitted or spongy. Another variety more frequently met with, is very superficial, hence termed by the French 'exulcerous.' The deeper parts of the skin are not implicated, the edges are not so sharply cut or undermined, the discharge is adherent and not so abundant as in the punched out ulcer. A third variety is due to the production of greyish prominent granulations whereby the surface of the sore is raised above the level of the surrounding parts. This form of chancre has been called the 'fungating sore' or 'ulcus elevatum.'

The three varieties of local venereal sore, though differing from each other within certain limits, have many characters in common, which may be stated as follows:—

1. The base of the ulcer when quite free from congestion, is as supple as the neighbouring tissue, but if inflammatory action be going on rapidly, the base may be swollen and hard. This state somewhat resembles the induration of the syphilitic initial sore, but the swollen base of an inflamed local ulcer is hard and inelastic like the base of a boil, which in fact owes its thickening to a similar cause. The base of a syphilitic sore has a peculiar elasticity, which is most readily detected when there is no inflammatory action going on. Syphilitic induration may be closely simulated, if the inflammatory action of the simple ulcer has been kept up by repeated cauterisation; in such cases it is now and then impossible to distinguish whether the thickening be syphilitic or artificial, until time has been allowed for observation.

2. The form of the ulcer is sharply cut, the edges are frequently undermined, and the floor is spongy as if wormeaten.

3. The discharge is abundant and exceedingly irritating, whence it inoculates the parts around, and thus evinces its next distinguishing peculiarity, namely—

4. Its faculty of multiplication: in 254 cases of simple chancre,[1] 81 per cent. had more than one ulcer at the same time, and 46 per cent. more than two ulcers. This multiplicity of the local sore is exceedingly common in women, in whom six, eight, or ten chancres at one time are not unusual. Barié [2] has published notes of some

[1] Fournier: Leçons sur le Chancre, par Ricord, p. 34.

[2] Barié: Annales de Dermatologie et de Syphiligraphie. 1873-74. No. 5, p. 353.

cases under the care of Fournier in the Lourcine Hospital, in one of which there were seventy-one, and in another seventy-five chancres. The sores were scattered over the genito-crural folds, perinæum and anus, as well as the genital organs; one of the women had two chancres on the cervix uteri. Both these patients had also a profuse vaginal discharge, which, by continually flowing over the external genital organs, no doubt aided in multiplying the sores. The auto-inoculable quality of chancrous pus also explains the frequency with which it is inoculated through accidental breaches of surface on other parts of the patient's body. Thus the thighs and buttocks of careless persons are often inoculated from their own chancres.

5. All varieties of the local sore have a tendency to spread, to inflame and slough, and to excite inflammation in the absorbents connected with them, causing *bubo*. At the same time the simple chancre often runs its course without any implication of the lymphatic glands; and even when this does occur it is often simply the result of local irritation of the gland, in which case the affection is termed *simple* or *sympathetic* bubo. Abscess is also sometimes caused by the contagious discharge of the sore finding its way along the lymphatic vessels to the glands. In this case suppuration is inevitable, and the cavity of the abscess, being inoculated by the matter within the gland, is converted into a sore which differs from the parent chancre only in size and extent. Thus the *virulent* bubo is produced.

The course and duration of chancre vary very much when not influenced by appropriate treatment. The course is by some divided into three stages, namely, the increasing, stationary, and healing stages. During the first week or ten days the chancre continues to increase; then comes a period of about a fortnight, during which the sore is almost stationary; after this repair begins and the ulcer gradually heals. In the ordinary sore, which does not spread rapidly, nor attain a size beyond that of a sixpence, the duration is usually about a month or six weeks. The situation of a sore has much influence over its duration; sores among the folds of mucous membrane at the entry of the vagina, or about the anus, heal more slowly than those of the labia. Chancres of the penis, if covered by the foreskin, or situated about the frænum, are also difficult to heal.

When the sore loses its specific characters, the surface granulates, healthy pus is secreted, and a bluish white line of cicatrisation replaces the sharply-defined border. The superficial variety of sore leaves no scar; but the deeper one, which penetrates through the true skin, leaves a permanent cicatrix, while the sloughing sore

often causes much deformity from the extent of its destructive action.

Seat of Chancre.—Of local sores 99 per cent. are situated on the genitals; but they have been observed on every part of the body, and experiment shows that chancre can be readily produced on any point of the surface.[1] On the male genital organs, the great majority of local sores are found in the furrow behind the glans, and beside the frænum. After these situations, but much less commonly, the meatus urinarius and surface of the glans are selected. Chancre of the meatus is mostly found in persons who have a short frænum, and who have the glans habitually covered by the foreskin. Chancres of the frænum usually destroy it, and often penetrate to the urethra, the tissues being very thin at this point. Chancres are said to be occasionally produced as far within the urethra as the fossa navicularis, though venereal ulcers in this situation are nearly always of a syphilitic nature. Chancres on the inner aspect of the foreskin, from the abundance of lymphatics in that part, are especially liable to cause bubo. They are also troublesome from the swelling and phimosis they occasion, and from spreading to the irritated glans beneath by consecutive inoculation. Abscess of the prepuce may also occur. Soft sores are very rare on the skin of the penis or scrotum, and are usually produced by consecutive inoculation from other parts. Clerc states that in two and a half years he had fifty-eight cases of syphilitic sore on the sheath of the penis, but during the same period only three of simple local ulcer in the same locality.

In women the entry to the vagina and the fourchette are by far most commonly the seat of the local ulcer; from these places they are constantly propagated to the nymphæ and to inflamed hair follicles on the labia majora, where they produce small circular sharply-cut sores—the so-called follicular chancres, or chancrous folliculitis.[2] Occasionally, as in men, chancres are situated at the meatus urinarius. On the vaginal portion of the uterus and the vaginal walls they are rare. Clerc,[3] nevertheless, describes them as being tolerably frequent on the cervix. In making this statement he relies on the inoculability of the discharge of the ulcers to confirm his diagnosis. But it has been shown that acrid matter of various kinds, and not only venereal pus, will often produce a pustule if inserted into the skin. Chancres of the cervix, according to Rollet,[4] are always produced by direct inoculation, and are most frequently seen on the

[1] Clerc: Maladies Vén., p. 204. Rollet: Mal. Vén. 1860.
[2] Gougenheim: France Médicale, 1880. April 14.
[3] Clerc: Loc. cit., p. 197.
[4] Rollet: Annales de Derm. et de Syph. Vol. ii. 1869–70, p. 50.

anterior portion. Rollet attributes this to the condition of slight anteversion usually found in prostitutes. Chancres of the cervix also usually inoculate the parts about the fourchette from the constant tendency of their discharge to flow downwards. Bernutz and Goupil[1] remark that they have twice seen inflammation of the pelvic portion of the peritoneum during the evolution of uterine chancres. Between July, 1867, and July, 1868, we met with only two cases of ulcer of the uterus among the female out-patients of the Lock Hospital that were sharply cut and suppurating like the sore so constantly found at the fourchette. All degrees of sores, from slight congestion and erosion to freely suppurating ulcers with granulating surfaces, are common in women of the prostitute class, but they cannot be all called chancres, even if their discharge be now and then inoculable. Ulcerations within the neck of the uterus have been known to secrete a contagious pus. Clerc[2] quotes an instance of a prostitute who was apparently free from venereal disease; however, as the woman had infected several men, she was subjected to a minute examination of the genitals. A drop of pus, squeezed from the mouth of the uterus, produced four well-marked ulcers when inoculated on the thigh.

At the anus chancres are sometimes met with through communication *a preposterâ venere*, but more frequently by consecutive inoculation from sores on the genital organs. In women the proximity of these parts to the anus renders such an accident very easy. Clerc has observed the chancrous inoculation of leech bites in this situation. Chancres of the anus generally assume a fissure-like form rather than a circular one. They are distinguished from the ordinary fissure by their grey surface, sharply cut edges and thick purulent discharge, which is readily inoculable on the patient. Chancres in this situation sometimes extend into the rectum, and if they are attacked by phagedæna the contraction of the resulting scar may give rise to stricture.

In deciding as to the mode of production of sores about the anus, Ricord[3] attaches much importance to the median position of the lesion when it is due to direct contagion. In such cases the sore is most frequently at the anterior margin of the anus, but sometimes at the posterior margin, and sometimes in both situations. The nearer the ulcer is to the anal orifice and the more it penetrates into the rectum, and especially when placed in the median line, the more probable is it that the sore is due to unnatural intercourse. Ulcera-

[1] Bernutz and Goupil: Maladies des Femmes. 1862, vol. ii., p. 169.
[2] Clerc: loc. cit., p. 198.
[3] Ricord: Clinique Iconographique, Pl. xiii., bis.

tions otherwise produced are farther away from the anal orifice, and are met with at any part of the circumference.

The great rarity of simple contagious ulcers on the *head*, *face*, and *lips*, suggested the notion which was held very generally at one time, that the skin of this region had some power of resisting the virus. This however was shown to be erroneous by the result of artificial inoculation of chancrous pus on the lips and face, when it was found that ulcers were as easily produced on those parts as elsewhere. Hübbenet [1] successfully inoculated some chancrous pus on the cheek of a soldier. Clerc has collected several cases where chancres were inoculated by the patients scratching themselves with dirty fingers; one on the eyelid, one on the external auditory meatus, and one on the lip.

Among many other instances of cephalic chancre, three recorded by Profeta [2] may be noticed. In the first case the sore was situated on the cheek, and had lasted for two years before the patient came under the care of Profeta, who inoculated himself from it, the result being a soft chancre from which a second similar sore was produced. In another case a barber opened a bubo accompanying chancres by means of a razor, with which he cut his finger. The man then sucked his wounded finger, the consequence being the development of soft sores on both his lips. In the third case the sore was on the ala of the nose, the source of the poison being a phagedænic chancre of the genitals. In this case the nasal sore also became phagedænic.

The infrequency of chancre in this region is fully accounted for by the fact that it can only be produced by the contact of matter from a similar sore; whereas the initial lesion of syphilis, which is comparatively frequent about the face and lips, may be propagated by the discharge of mucous patches or ulcers of the mouth and lips, which are very likely to be brought into contact with similar parts of other persons during kissing, or in the numberless modes of contagion by drinking vessels, pipes, etc., which have been noticed in the chapter on Syphilitic Contagion. It must be mentioned, however, that chancres are occasionally found in the mouth [3] or on the lips from direct contact as the result of certain practices which need not be more particularly described.

The groins are frequently the seat of chancre. Their proximity to the genital organs renders them very liable to be inoculated at any accidental breach of surface, as well as by the conveyance of matter along the lymphatic vessels to the inguinal glands.

[1] Hübbenet: loc. cit., p. 44. See Clerc, also, for the experimental inoculations of Puche, Bassereau, and others, pp. 203–4.

[2] Profeta: Annales de Derm. et de Syph. 1874, p. 195. See also Nadaud des Islets: De l'inoculation du chancre mou à la région cephalique. Thèse de Paris, 1858, and R. W. Taylor: A case of cephalic chancroidal ulceration: Brown Séquard's Archives of Med. No. 5, 1873. Venot: Deux cas de chancre mou cephalique: Bordeaux Médical. 1875, No. 14. Desprès also mentions a case of soft chancres of the auditory canal: Annales des Mal. de l'Oreille, du Larynx, &c. Dec. 31, 1878.

[3] See Diday: Observation de chancrelle de la bouche. Annales de Derm. et de Syph. vol. iv., p. 92.

The *thighs*, *feet*, and especially the *fingers*, are now and then inoculated by contamination with chancrous pus from the genitals.

Bumstead[1] mentions the case of a boy under his care for chancres of the penis, who produced a similar ulcer on his leg by scratching a pimple in that situation. Tirard[2] records two instances in which a burn of the right forefinger became inoculated with the pus of chancres on the penis from which the patients were suffering at the time. In both these cases virulent suppuration of the epitrochlear gland took place. We have seen several cases of inoculation of the finger. In one instance a medical student became inoculated while dressing the sore of a patient. In this case also virulent suppuration of the epitrochlear gland occurred.

The aspect of the chancre differs more or less according to its situation from the typical forms which have been described. In the furrow behind the corona the sore is elongated in shape, and in the fold of mucous membrane near the frænum it often looks at first like a small fissure; this, as already mentioned, being also its usual form when situated among the folds of the anal mucous membrane. The ulcer is also irregular in shape when several sores run together, as not infrequently happens on the female genitals. Again, if a chancre seated on parts exposed to the air be neglected, it frequently becomes covered by a thick scab, from the accumulation of the discharge. When the interior of a follicle has been inoculated, the discharge often accumulates and the follicle becomes distended, and resembles for a time a minute abscess or acne-pustule (follicular chancre).

Complications.—There are three main complications of chancre—inflammation; sloughing phagedæna; and serpiginous ulceration, or slow continuous destruction of tissue, which is also called by some "slow phagedæna."

Inflammation.—This is a common result of neglect of cleanliness, especially when the sore is situated under the foreskin, and phimosis prevents removal of the discharge. Other causes of inflammation are, violent exercise, debauchery of any kind, chafing of the dress, and the application of irritating dressings.

When inflammation begins the skin around the sore grows hot, red and swollen, the sore extends quickly, with sharply cut or notched edges, and furnishes a plentiful discharge mixed with shreds. The base is hardened by congestion, and often raised above the surrounding skin. The pain which accompanies the inflammation is often very severe, of an aching or smarting kind. The inflamed chancre is common about the frænum, which it quickly destroys. If the sore

[1] Bumstead and Taylor: loc. cit., p. 344.
[2] Tirard: Annales de Derm. et de Syph. Vol. iv. p. 134.

is underneath a tight foreskin, the penis swells rapidly and the sloughing often perforates the prepuce. When the slough escapes through this opening, the inflammation commonly subsides, and the sore either regains its original contagious condition, or, if the sloughing have destroyed the whole of the original chancre, it becomes an ordinary healing sore, of which the pus is no longer inoculable.

The amount of constitutional disturbance which accompanies the inflammation varies much. There may be prostration with fever; but as a rule the general health suffers only to a very small extent.

Sloughing phagedæna.—When the inflammatory action is carried to an extreme, the *sloughing phagedænic chancre* is produced; that is, an ulcer where the destruction of tissue is rapid, copious, and continual. The part swells, grows livid red for some distance round the ulcer, and the discharge is much lessened. The ulcer itself rapidly enlarges and dries. Its margins are then dark brown or black and shrunken. In 24 or 48 hours the layer that was first attacked separates, and the destruction continues widely and deeply.

The course in sloughing phagedæna is much more violent than in the inflamed chancre. Destruction of tissue spreads widely, involving large areas of integument, or deeply through the cellular tissue among the vessels, nerves, and muscles. These structures themselves are not infrequently attacked by the necrosing action, though they may be left dissected from their surroundings without actually perishing. Indeed, the activity and penetration of the phagedænic action varies from moderate violence to the most rapid and complete destruction of the parts invaded. If the penis is attacked, the whole thickness of the organ is sometimes destroyed. In women, the sloughing may spread from the labium to the anus, clear away the perinæum, and form a cloaca common to the vagina, bladder, and rectum. If the groin be the seat of the affection, the skin and cellular tissue and lymphatic glands may slough away, leaving exposed and sometimes even opening the great blood-vessels.

In one form of these sloughing sores, the surface is covered by a tenacious white slough, beyond which the ulcer spreads with sharply cut, irregular edges, and a thin sanious discharge oozes from beneath the slough. In a short time the early slough grows dry and dark-coloured, while the more lately-destroyed tissue is white. When a very large mass of tissue is destroyed at once it turns black and shrivels. The destruction of tissue continues around the first slough, and the ulcer widens rapidly, with a ragged red border, and secretes a bloody serous discharge.

While sloughing is going on, the pain is usually very severe, and

asthenic symptoms may develope; the temperature rises, the thirst is great, the appetite fails, the tongue becomes dry, brown, and cracked, and the pulse very rapid and weak.

When the phagedænic action is arrested, the pain and swelling diminish, healthy suppuration sets in, the slough separates, and healing by granulation commences. The termination of this affection depends on the patient's bodily strength; if, in its violent form, it continue more than a few days he may sink from diarrhœa or other form of exhaustive irritation.

The pus of a phagedænic sore does not produce phagedæna when inoculated on another person. On the other hand, phagedæna does not destroy syphilitic contamination to which the patient may have been exposed. In 1861, 1862, 1863, and 1864, of twenty-seven cases of phagedæna, syphilis followed in seven at the Royal Naval Hospital of Plymouth.[1] Phagedæna is also recorded to have attacked artificially inoculated chancres and virulent buboes, as well as those propagated by venery.[2]

Serpiginous ulceration is a very slow continuous form of destruction in which the sore spreads widely along the skin and subcutaneous cellular tissue, healing at one part while it extends in another. Sometimes, the whole thickness of the skin is not destroyed, but undermined. In this way the sore may run round the penis, along the foreskin, and penetrate through the under part of the glans to the urethra, or burrow under the skin to the pubes. The discharge of this ulcer is thin and scanty; nevertheless, it is often inoculable on the bearer, even when the chancre has lasted for years.[3] These ulcers are also very liable to relapse, and a cicatrised part may ulcerate again rapidly. The scar, when the sore has healed, is white, firm, and adherent. At first there is generally but little constitutional reaction with these serpiginous ulcers, but after a time the patient becomes debilitated and much depressed.

Causes of phagedæna.—In cases of rapid phagedæna, the usual causes of debility are generally extreme. Hence, in civil practice, it is seen most often in young half-starved prostitutes, in labourers who have undergone much fatigue and exposure, in persons of scrofulous constitution, or in those exhausted by typhus or scarlet fever. In military or naval practice, phagedæna is seen when the men are weakened by hard campaigning, or rendered unhealthy by overcrowding in hospitals or on board ship, and by other causes of like kind. Thus, when the French army was returning from the Italian campaign in 1859, sloughing attacked the venereal ulcers among

[1] Beith: Evidence before Committee on Ven. Dis. in Army and Navy. 1865, p. 152.
[2] Fournier: Nouveau Dict. de Méd. et de Chirurgie Pratiques. 1879, tom. 27, p. 51.
[3] Fournier: Leçons sur le Chancre, par Ricord, p. 396.

the troops.[1] Mercury has been accused of producing sloughing action in chancres; if this drug be given in very large quantity, it is possible such a result might ensue, but phagedæna occurs, in the vast majority of cases, where no mercury has been given. Moreover, Sperino, in his experiments on syphilisation, did not find that inoculation of the pus of sloughing ulcers produced phagedæna in those who had taken mercury.

Though sloughing phagedæna is set in action by the causes just enumerated, there are cases where no such influence can be detected. At the Lock Hospital patients are met with who, but for the rapidly necrosing chancre itself, present every sign of good health. This fact reduces us to the acknowledgment that, besides the foregoing predisposing causes, there is probably some exciting cause which may be of itself sufficiently powerful to produce phagedæna without the aid of predisposition. To explain in what this cause consists different hypotheses have been elaborated by various authors.

Thiry[2] for example maintains that the phagedænic course of chancre depends solely on the activity of the pus in the sore itself. This activity is accidental and may be evoked by local circumstances: viz. (1) more or less intense inflammation, (2) exaggerated sensibility, (3) a torpid state of the chancre, of which the atonic condition suffices only for degeneration of the newly formed tissue, and not for its perfection into reparative or cicatricial tissue. In our opinion these explanations are little better than assumptions, and we would ask what produces the excessive inflammation in the one case, or what the nervous erethism in the other? Hutchinson[3] has attempted more philosophically to account for the origin of phagedæna. In the first place, he considers the patient's temperament. Certain persons have special proclivity to acute inflammation; and such a patient if attacked by chancre would be more likely to have a phagedænic form of chancre. Another disposing cause is the kind of tissue attacked, and to these two causes Hutchinson adds some peculiarity in the virus itself. In many cases, if not in all, Hutchinson[4] believes that syphilis is either directly or indirectly "the parent of phagedæna."

Undoubtedly syphilis is often the determining cause of phagedæna and of serpiginous ulceration. That dyscrasia is also a potent excitor of destructive ulceration in sores other than chancrous, for example, gummata and rupial ulcers. Such tertiary sores indeed are much more frequently the starting point of phagedæna than primary

[1] Follin: Pathologie externe, tom. 1.—Syphilis.
[2] Thiry: La Presse Médicale Belge. 1878. Nov. 1878.
[3] Hutchinson: Medical Times and Gazette. 1877, vol. i., p. 385.
[4] Hutchinson: Path. Trans. 1876. Discussion on Syphilis, p. 345.

ones. Similarly, a chancre is more likely to become phagedænic on a syphilitic person than on one not so affected. But this explanation covers only a part of the cases of phagedæna met with in practice: there are others in which some other cause is active, syphilis being absent.

It is probable that a right method for arriving at a correct explanation is to separate, in the first place, the several forms of phagedæna. The acute, rapidly destructive forms which in our description we have named 'inflamed chancre,' and 'sloughing phagedæna,' are, we think, distinct from the slow serpiginous ulceration that affects mainly the skin and immediately contiguous tissue. In the former, exhaustion or general debility is usually present; while in the latter these phenomena seldom appear until produced by the slowly depressing effect of the sore itself on the patient's economy. Hence, in the present state of our knowledge, we must admit that in many cases the exciting cause of phagedæna, and especially of serpiginous ulceration, is not known; but that in some cases constitutional exhaustion and syphilis are sufficient to excite them.

Hæmorrhage not infrequently takes place from a phagedænic chancre, and though often of little moment and easily arrested, it may nevertheless in some instances be profuse and even severe enough to place the life of the patient in jeopardy.

Syphilis.—Simple chancres are not infrequently much altered in their aspect before healing, by the development of characters peculiar to syphilis after the completion of the period of incubation proper to that disease. These changes are described in the chapter on the Initial Manifestation of Syphilis.

Diagnosis of Chancre.—It is usually easy to decide whether a sore on the genitals is derived from a local contagious ulcer if attention be paid to the distinctions that will be immediately enumerated. It is true, there is often a difficulty in deciding whether syphilis has been imbibed at the same time as the local irritant. It will be impossible to solve this difficulty in all cases if the source of the sore is uncertain, and if the period necessary for the incubation of syphilis has not elapsed when the examination is made. The chief points to be remembered in making a diagnosis between chancre and syphilis are given in the following table.

DISTINCTIONS BETWEEN THE LOCAL CHANCRE AND THE INITIAL MANIFESTATION OF SYPHILIS.

LOCAL CHANCRE.	SYPHILIS.
1. Incubation nil; irritation is at once displayed by reddening and speedy ulceration of the point of contagion.	1. Incubation is always of some length: the average being twenty-four days.

Distinctions between the Local Chancre and the Initial Manifestation of Syphilis—*continued.*

LOCAL CHANCRE.	SYPHILIS.
2. Ulceration frequently begins by a pustule. Ulceration is an essential condition, and is always very active during the first few weeks.	2. The manifestation begins by a papule. Ulceration, if accidental irritation be absent, is never active. Superficial erosion is sometimes present as soon as induration begins, but even this is often delayed till the induration is advanced, and may be altogether absent.
3. The character of the ulceration is virulent. The duration depends on the influence of *local* remedies.	3. The character of the ulceration is indolent. The duration depends on the condition of the patient, and on the influence of *constitutional* treatment.
4. The ulcer is characteristic; it is hollowed, and the surface is spongy; the edges are sharply cut and undermined; the discharge is opaque, yellow, and plentiful.	4. The papule is characteristic; it is often not in a state of ulceration, but simply eroded, or desquamating. When the surface is ulcerated, it is smooth, and covered with adherent, scanty secretion. The edges are not undermined, but raised, sloping, or rounded.
5. The base of the sore is supple, unless thickened by inflammatory congestion; but this pseudo-induration disappears when the inflammation is subdued.	5. The base of the papule is of gristly hardness, quite independent of inflammatory action. The induration is peculiar in character, very rarely absent in men, and generally present in women.
6. Multiplicity of the sore is the rule. This results from the consecutive inoculations of the parts around with the discharge of the original sore.	6. The papule is usually single. When there are more than one the papules are all of one age.
7. The lymphatic glands remain either unaffected, or become acutely inflamed, and form abscess, which may be simple or virulent.	7. The lymphatic glands are affected by slow, irregular enlargement of the whole group, at a certain time after infection; suppuration is infrequent, and when present, is the consequence of ordinary irritation.
8. When the bubo is virulent, the matter is inoculable on the bearer. The bubo itself becomes converted into a chancre.	8. When abscess forms around the enlarged lymphatic glands, the matter is not inoculable on the bearer.
9. However long the chancre lasts, it remains a local disease.	9. Between two and three months after contagion, erythematous and papular eruptions appear on the surface of the body.

DISTINCTIONS BETWEEN THE LOCAL CHANCRE AND THE INITIAL MANIFESTATION OF SYPHILIS—*continued.*

LOCAL CHANCRE.	SYPHILIS.
10. Phagedæna and ulceration of an inflammatory kind are frequent complications.	10. Inflammation or extension by ulceration is rare.
11. Pain in the sore is usually sharp, often severe.	11. Pain is usually absent.
12. Seldom observed away from neighbourhood of the genital organs.	12. Not infrequently met with on parts away from the genitals—on the lip or finger for example, and on the breast in women.
13. The source is a similar ulcer.	13. The source is most usually an ulcerating papule of a syphilitic eruption.
14. Antecedent to the disorder, the patient may or may not have had syphilis, and may have had similar ulcers several times before.	14. Antecedent to this, the patient has not had syphilis, nor such a hard-based ulcer.
15. The secretion of the sore is inoculable on the bearer, until cicatrisation is advanced.	15. The secretion is rarely inoculable on its bearer, and only so when its surface is irritated into suppuration.
16. The discharge is also inoculable on animals.	16. Syphilis is not inoculable on animals.
17. It may be many times repeated in the same individual.	17. It is only once developed in the same individual. Exceptions to this are too rare to invalidate the rule.

By comparing the sores in a large number of patients with the source whence they had been contracted (*Confrontation des Malades*), Bassereau was enabled to point out the distinction between the local contagious sore and the primary manifestation of syphilis. He found that in 73 cases of syphilis, where he was able to make this comparison, the source was without exception a person suffering from syphilis. This mode of investigation was continued by Ricord, Fournier, and many others, with complete success in showing that non-syphilitic persons communicate only the local ulcer, and only syphilitic persons the general disease. Clerc and his pupils also traced simple chancres to their sources, and collected a long array of examples of chancre spreading among individuals without any one of them having syphilis. The following case, recorded by M. Vivien, one of Clerc's assistants, is very characteristic.[1] In 1853, a law student entered a Maison de Santé, to be cured of seven or eight chancres on the glans penis, and of suppurating buboes.

[1] Clerc : loc. cit., p. 218.

The mistress of this patient had also infected two medical students, of whom one had several chancres and a suppurating bubo; the other, a chancre only. The woman was herself admitted to Lourcine Hospital with several chancres and a bubo in each groin. All the members of this group of patients were afterwards watched carefully by Vivien, and none suffered from syphilis. By experiment also these chancres have been inoculated on persons virgin of syphilis, without producing any constitutional disease: instances of this kind are related in the chapter on "Diseases confounded with Syphilis."

Auto-inoculation.—Although the mere fact of auto-inoculability does not of itself prove that a given lesion is a chancre, inoculation of the discharge may be required in certain cases for purposes of diagnosis. It has already been explained, however, that inoculability of an early venereal sore does not prove absence of the syphilitic virus, for the lesion may be a "mixed sore," in which case symptoms of syphilis will only manifest themselves after the period of incubation proper to that disease. As regards the diagnosis of chancre from other lesions, it may be laid down as a rule that if inoculation be *quickly and clearly* successful the diagnosis of chancre is almost certain.

In practising inoculation for diagnostic purposes, care should be taken to choose a locality where the sore will be little likely to give rise to bubo; favourable situations are the outer surface of the thigh and the upper part of the abdomen. In all cases, the artificially produced sore must be destroyed with strong caustic as soon as it has served its purpose.

Some *local affections* may be confounded with the contagious ulcer. *Herpes* may be distinguished by its groups of vesicles or excoriations on a red areola; these excoriations are also quite superficial, and often cause much itching. Herpes again, is generally a frequent occurrence in those subject to it, and the patient often speaks of previous attacks. A simple lotion with cleanliness heals the herpes in a few days, but a chancre is not cured in so short a time.

Simple Fissures are distinguished from chancrous fissures by the ease with which they are cured by simple remedies. When the discharge of a chancre has been allowed to collect and has dried into a scab, this must of course be removed before a correct diagnosis can be made.

With *phimosis*, it is sometimes difficult to say whether a discharge from beneath the prepuce be caused by balanitis, gonorrhœa, or chancre. If cleanliness do not quickly subdue the swelling, and there be no discharge from the urethra, a chancre is probably the cause of the discharge. To decide the point, the inoculability of the

pus may be tested. Besides, in chancre, there is often much tenderness at one spot, the discharge is also less in quantity and sometimes bloody. When gonorrhœa and chancre are present together, the latter is often overlooked till the urethritis has been reduced.

Ulcerated mucous patches, especially on the female genitals, sometimes resemble the simple chancre in form and aspect, but the presence of the concomitant signs of syphilitic disease elsewhere will commonly remove any hesitation about their origin.

Tertiary gummy deposits also sometimes ulcerate into cavities resembling chancres; but the presence or traces of syphilitic disease elsewhere, and the history of the case, usually render distinction easy. In doubtful cases, auto-inoculation should be practised. Clerc[1] relates a case of this kind which he mistook for a chancre until he found a gummy nodule on the thigh, which the patient said resembled what the ulcer had been before it broke. Iodide of potassium quickly caused both to disappear.

Epithelial or lupous ulcers of the genitals, especially in females, are occasionally mistaken for chancres.

The following instance occurred to myself: A woman, ætat. 33, whose perinæum had been ruptured during childbirth, came under my care at University College Hospital in July, 1866. I found a ragged uneven ulcerating surface at the perinæum which reached to within half an inch of the anus, and spread upwards into the vagina, and along the right nympha. The edges of the ulcer were irregular, and sharply cut; its base was spongy, freely suppurating, and not thickened. There was no history of syphilis, but there had been an abscess in the right groin. I concluded that the ruptured perinæum had been inoculated by a chancre in some way. As the ulcer had existed for three months and caused much pain, I destroyed its whole surface with nitric acid under chloroform. The pain was much relieved by this treatment, and the surface, when the eschar had separated, appeared inclined to heal. In a few weeks however the sore regained its former condition. After six weeks' further treatment the patient, unwilling to remain longer in hospital, was discharged. In the following December she returned, suffering greatly from the ulcer of the perinæum, which was then very much changed. Numerous prominent fungating growths sprouted from the surface, and the ulceration had spread along the vagina, nearly as far as the uterus, besides destroying the right nympha and attacking the left. It had also extended into the rectum. The patient shortly afterwards died of bronchitis and exhaustion, at her own house, but I was not permitted to make a post-mortem. This case was, I now think, probably an epithelial growth from the first, but its character and history led it to be mistaken for a chancre.—B. H.

The *prognosis* of the local sore is good. Most chancres, if not irritated, heal naturally in six to eight weeks, and in much less time if appropriately treated. Should inflammation or phagedæna supervene, the prognosis will of course depend on the nature and severity of the complication.

[1] Clerc: loc. cit., p. 235.

Bubo.—The term 'bubo' is not limited, as its name would imply, to glandular enlargement of the groin, but is often used in describing such enlargement accompanying sores on any part of the body. The particular gland to be first irritated, or, if actual transport of the virus takes place, contaminated by the chancre, is that one into which the lymphatic vessels leading from the chancre directly open. Auspitz[1] has traced the arrangement of the glands of the groin, and divides the superficial set into four groups. The first group consists of one large gland or of several glands closely connected, and is situated about the middle of the groin, just external to the position of the great vessels. This set receives the lymphatic vessels of the lower part of the abdominal wall, of the buttock, and occasionally of the dorsum penis. The next group, consisting of a large gland and two or three small ones, lying also superficially along the fold of the groin but more internal than the first, receives the lymphatics from the penis and scrotum in the male and the labia in the female. A third group lies over the cribriform fascia and usually receives no vessels direct from the genitals, but it is nevertheless more nearly related to the inguinal than to the femoral glands. A fourth or femoral group lying just outside the upper portion of the saphena vein receives the absorbents of the lower extremity, and rarely any of the pudendal region. Passing backwards from these groups of superficial glands their efferent ducts are directed to a deeper set, generally very few in number, lying along the femoral vein and inner part of the crural canal. Owing to not infrequent variations in the distribution of the absorbent ducts, the particular group to be affected varies in different persons. The largest gland of the second group is that most frequently first attacked in cases of chancre of the genital organs. Of 207 cases of simple sore collected by Ricord,[2] 65 had bubo. In Beith's table,[3] about half of the ulcers not connected with syphilis were thus complicated.

Bubo is more frequent in men than in women. In the Vienna general hospital Auspitz[4] noted that 58 per cent. of the men and 35 per cent. of the women with simple chancre, had suppurating buboes. This average, as well as that of Beith, is probably too high; indeed, Auspitz admits that hospital statistics cannot be relied on for giving a fair percentage, as the patients often only apply for relief on account of the bubo which incapacitates them from work. Bubo may be single or double (about 14 per cent. of Auspitz's patients had double bubo), and usually forms on the same side as the chancre

[1] Auspitz: Die Bubonen der Leistengegend, Archiv für Derm. und Syph. 1873, p. 443.
[2] Fournier: Ricord, Leçons sur le Chancre, p. 40.
[3] Beith: loc. cit., p. 152.
[4] Auspitz: loc. cit.

which gives rise to it, but it may develope on the opposite one. The position of the bubo no doubt depends on the arrangement of the lymphatic vessels, which is liable to variation. This has been already mentioned in the chapter on the Initial Manifestation of Syphilis.

There are two varieties of Bubo. The first and commoner variety, sometimes called *sympathetic*, consists in simple irritative inflammation of the gland and surrounding cellular tissue. In the second variety pus is conveyed directly to the gland by the lymphatics from the chancre; this gives rise to the *virulent* bubo.

Simple or Sympathetic Bubo.—This form does not differ from the inguinal abscess sometimes occurring in gonorrhœa, and only in position from that following an irritating sore on the foot or other part of the lower limb. Simple bubo may occur at any time during the progress of a chancre, but is most frequent in the first fortnight. The gland which first receives the lymphatics swells and grows very tender, rendering walking and even standing painful. In the early stage it can be distinctly felt under the skin, but it is soon masked by congestion and inflammation of the surrounding cellular tissue, and thus forms an oval tumour over Poupart's ligament. The skin over the swelling assumes a dusky red tint, and grows soft and doughy to the touch. Pus forms in the congested cellular tissue round the gland, and presently the abscess bursts through the skin; its contents escape, and the cavity heals by granulation in the ordinary way.

The duration of the bubo is usually a month or six weeks, but it is often prolonged by the obstinate sinuses which are left.

Indolent Bubo.—In this form the enlargement is much slower, and usually attacks both sides; several glands are attacked, and produce a doughy, ill-defined, somewhat tender swelling, in which the separate glands cannot be distinguished from each other. The skin, after some weeks or even months, becomes dark reddish purple; and in course of time fluctuation can be detected at several points. The pus thus formed makes its way to the surface, and tunnels several sinuses in a mass of ill-organised cellular tissue, which may last many months before they heal. This variety of bubo has been also called *scrofulous*, from its occurring in persons of that habit, and from resembling other scrofulous lymphatic abscesses. Abscesses of this kind usually extend outwards towards the iliac spine, as well as towards the perinæum. Their duration much depends on the patient's general health, and on the kind of treatment pursued. When the bubo is healed, it leaves a cicatrix, at first dark in colour, but subsequently turning white.

Virulent Bubo.—In this form of bubo suppuration is first excited in the interior of the gland by the contagious matter being conveyed direct from the chancre along the absorbents. It may follow a

simple, inflamed, or serpiginous chancre. The inflammatory action inside the gland quickly extends to the cellular tissue, and sets up an abscess there which becomes inoculated by the contagious matter that is set free when the gland breaks up or is punctured. The abscess thus itself becomes a chancre, and resembles the original sore in all its characters, though much exceeding it in size. Before the abscess is inoculated by the escape of chancrous pus from the interior of the gland, a virulent bubo in no way differs in its course or appearance from a simple one. Ricord, in his "Letters on Syphilis," describes an experiment to prove that the matter of an abscess formed about a gland is not contagious until mixed with the pus from the interior of the gland. He opened a bubo, and inoculated its pus without effect; he then punctured the gland lying at the bottom of the abscess, and let out a drop of pus; this was inoculated with success, and, moreover, the pus of the abscess itself became inoculable after mixture with that formed within the gland. Further corroboration of this transport of the contagious matter from the chancre along the lymphatics to the gland is gained by the fact that the original sore may heal completely before the bubo suppurates, and accidental inoculation of the abscess from the surface of the sore becomes impossible. It is still uncertain what determines this absorption of pus into the gland; it takes place in only a small proportion of suppurating buboes, and there is no fixed period for its occurrence, though, according to Auspitz, it is most frequent during the third or fourth week after the appearance of the chancre. Puche's case[1] shows that it may take place in chancres which have long existed. He remarked that a serpiginous chancre, which had existed more than three years, suddenly produced a bubo with inoculable pus.

Usually one gland only is attacked, and that acutely. There is considerable pain in the part, and general disturbance. When the abscess is opened and becomes inoculated with the matter from within the gland, the surface rapidly grows irregular and worm-eaten; the borders become eroded, and often much undermined. The undermined skin turns dull violet in colour, and now and then an isolated bit sloughs off. The discharge is puriform, plentiful, thinner than that of the original abscess, but contagious and inoculable on the patient himself. The abscess, thus converted into a chancre, may become phagedænic or serpiginous, and before it heals may spread over a wide surface, and cause a considerable loss of tissue. The fascia is sometimes laid bare in the floor of the ulcer, and other lymphatic glands are exposed. The blood-vessels around

[1] Fournier : Ricord, Leçons sur le Chancre, note viii., p. 396.

may ulcerate, and thus troublesome or even dangerous hæmorrhage may occur; or a great part of the skin of the groin, thigh, or abdomen, may be destroyed.

Virulent bubo is not confined to the glands connected with the genital organs. We have already mentioned instances of virulent bubo of the epitrochlear gland following chancre of the finger. Jullien[1] also reports a case where a man inoculated a scratch of the thenar eminence from a chancre on his penis. A virulent bubo in the axilla followed the inoculated chancre of the hand. Hübbenet[2] by experimental inoculation produced a chancre on the cheek, which was followed by a virulent bubo of the gland in front of the antitragus. The small lymphatic gland at the root of the penis is also occasionally inflamed, and the inflammation may be of a simple or virulent kind, just as may occur in other glands.

The *duration* is ordinarily two or three months, but the chancrous ulceration lasts until the power of secreting contagious pus is exhausted, a result sometimes not reached for one or two years. Fournier[3] records one of fourteen years' existence. Healing takes place slowly, and leaves a wide cicatrix, at first tightly adhering to the fascia beneath, but gradually becoming free and pale white.

Clerc[4] has observed two fatal cases of *peritonitis* in connection with bubo. In the first case a bubo in course of resolution was attacked by erysipelas, and, post mortem, recent peritoneal adhesions were found in the inguinal region. There was also at the internal abdominal ring a suppurating gland lying close to the peritoneum. The other glands in the neighbourhood were swollen, but not suppurating. In the second case, which was very similar in its course, the post mortem appearances were much the same as in the preceding, except that there was no suppuration of any of the glands.

A somewhat similar case is reported to have occurred in the Charity Hospital, New York.[5] At the necropsy it was found that the abscess caused by the suppurating bubo extended down to the peritoneum, and had served as the starting point of the peritonitis.

McCready[6] met with a sloughing bubo which opened into the bladder, and thus caused urinary fistula.

Bubo without chancre (*Bubon d'emblée*).—Inguinal abscesses occasionally form when no preceding genital lesion can be discovered. This occurrence has given rise to the belief that venereal

[1] Jullien: Annales de Derm. et de Syph. 1874, vol. v., p. 373.
[2] Hübbenet: loc. cit.
[3] Fournier: Nouv. Dict. Méd. et Chir. prat., tom. v., p. 771.
[4] Clerc: Annales de Derm. et de Syph. 1869, tom. i., p. 439.
[5] New York Med. Jour., March, 1877, p. 304.
[6] McCready, quoted by Bumstead and Taylor: loc. cit. p. 405.

pus may be absorbed during coitus, either directly through an unbroken surface, or that, gaining entry through a slight erosion or fissure, it may pass onwards without producing any lesion at the point of entry. It is difficult to believe in the possibility of either of these processes, and most of the cases of abscess in the groin without concomitant genital sore can be otherwise explained.

First, the fatigue of violent and repeated intercourse, without the irritation of any venereal poison, may cause simple bubo, just as severe walking, rowing or running will do occasionally. Young men of unknit frame, or of scrofulous habit, are more frequently so attacked than the full grown and vigorous.

Secondly, tertiary syphilitic affections of the groin, particularly of the lymphatic glands, may cause abscess and even phagedænic ulceration, thus giving rise to sores which may assume many of the characters of the virulent bubo.

Mauriac [1] has written an exhaustive essay on the so-called *bubon d'emblée*, and relates three cases in which gummata of the inguinal glands presented a remarkably close resemblance to chancrous buboes.

In the first case a man, aged 38, was admitted into the Midi Hospital in November, 1874, with a swelling in the groin but no lesion of the genital organs, and with no history of any venereal sore later than 1867. There were no signs of syphilis. The swelling burst and an ulcer remained, which was so like a virulent bubo that Mauriac considered a chancre must have existed before admission, and escaped the patient's notice. Auto-inoculation was advised by Mauriac, but through some mistake the ulcer was cauterised before this was carried out. Under tonics and various local applications the ulcer healed in a few weeks, and the patient went out. Ulceration however afterwards broke out again in the groin, and the patient was readmitted. A similar ulcer now appeared on the scrotum, which led Mauriac to suspect syphilis. Both sores became phagedænic, but rapidly improved under anti-syphilitic treatment. In the second case, a man who had had venereal sores six years before, had a swelling in the groin, which burst and left an ulcer of which the pus was inoculated without success. Under mercury and iodine internally, and with simple ointment locally, the ulcer had almost entirely healed in twenty-three days. The third case was that of a man who had been treated by Mauriac for syphilis two years before. In this case there were red fluctuating swellings in each groin, having all the appearances of chancrous buboes. There was no lesion of the penis, scrotum, thighs, perinæum, or anus; and the patient had not had connection for more than six months. The swellings were opened, and thick pus escaped. Inoculation gave a negative result. The ulcers became phagedænic, and assumed exactly the appearance of chancrous buboes. Under iodide of potassium improvement occurred at once, and under the continued administration of the drug with iodoform locally, cicatrisation took place.

In nearly all the cases reported as *bubon d'emblée* which do not come into one or other of the preceding categories, the absence of a preceding sore has not been conclusively established. Either

[1] Mauriac : Du Bubon d'emblée. Gazette des Hôpitaux. 1879. Juin et Juillet.

the patient has not come under the reporter's observation for some weeks after the date of supposed contagion, in which interval the patient might have had a sore that had healed before he was examined, or the examination has been imperfect; all the localities whence lymphatic vessels pass to the inguinal lymphatic glands have not been searched, and the positive absence of an ulcer from all of them made certain; or finally, in the case of the virulent bubo, absence of contamination of the open surface with chancrous pus from another source has not been proved. Of those cases where the most complete examination and history have been noted, one of Mollière's[1] and two of Profeta's[2] best bear criticism. But even these have weak points. In Mollière's case the time which elapsed between the supposed date of absorption and the evidence of inflammation extended to three weeks. It is difficult to conceive that virulent pus should be contained in a lymphatic gland for three weeks without causing irritation and inflammation. In Profeta's first case, it is not stated how long an interval took place between the appearance of the bubo and the examination of the patient. The primary sore might have healed and left no trace when the surgeon came to search for it. In Profeta's second case the patient's antecedents were not known, and during twenty-five days which elapsed between his first examination and his second the patient had not been under observation, during which time his bubo had become chancrous, very possibly from accidental contagion after the abscess had burst. These and other sources of fallacy are well pointed out by Mauriac in his paper already referred to.

Thus, in the present state of our knowledge, the existence of *bubon d'emblée* must remain doubtful. More exact and conclusive evidence than any that has yet been brought forward is necessary before the reality of such an affection can be admitted.[3]

Lymphangitis.—Beside the foregoing varieties of irritation and inflammation of the lymphatic glands, the *lymphatic vessels* leading to the glands are themselves sometimes inflamed, if the sore be on the prepuce or skin of the penis. The *symptoms* are a ridgy swelling, like a knotty string on the back of the penis, tender and often red; this lasts ten or fourteen days, and then subsides. Occasionally virulent inflammation from absorption of chancrous pus occurs. In such cases little abscesses form along the inflamed vessel, which become ulcers or chancres; they leave sinuses that fill and break alternately, with little tendency to heal if left to themselves.

[1] Mollière: Lyon Médicale. 1873, No. 4.
[2] Profeta: quoted by Mauriac, loc. cit.
[3] For other cases reported as *bubons d'emblée*, see Baumès: Précis des Mal. Vén., 1840, p. 40; and Diday: Annales de Derm. et de Syph. 1872-3, p. 423.

CHAPTER II.

TREATMENT.

General Treatment.—The first thing to attend to in treating venereal sores is the removal of all general causes of irritation, such as stimulating diet, alcoholic liquors, and sexual excitement. Severe exercise must be relinquished; indeed, confinement to the house for some days is often time gained by the progress the sore makes with rest. The patient should also avoid standing long at a time, to lessen the risk of bubo: the horizontal position, moreover, greatly promotes healing of the sore. If erections at night are troublesome, they may often be prevented by the patient's last meal being a light one, taken two or three hours before bedtime. For persons of ordinary health it is not necessary to do more than this; but if the patient be exhausted or in a debilitated condition, tonics, such as nitric acid and bark (F. 32), or iron and quinine (F. 29), will be necessary. The bowels also must be regulated by means of mild aperients.

Local Treatment.—The best application for uncomplicated chancres is iodoform. For this purpose the drug itself in fine powder may be used, or, to get rid of the powerful and now too familiar odour, it may be used in combination with various other drugs. The best preparation is the iodo-carbon paste (F. 58), which can be accurately adapted to all the irregularities of the sore. A solution of iodoform in Eucalyptus oil (F. 79) is also used. The sore must be dressed two, three, or four times in the twenty-four hours, according to the amount of the discharge. The surface of the ulcer should be cleansed by letting a stream of tepid water flow over it each time the dressing is changed, and then, if pure iodoform be used, the finely-powdered crystals should be sprinkled over the sore or be applied by means of a moistened camel's-hair brush, care being taken not to let the powder

touch the patient's clothes, otherwise he will carry a very perceptible odour of the drug about with him.

If the iodo-carbon paste be used, it should be spread evenly over the surface with a small piece of wood cut to a convenient shape. The oil may be painted on with a camel's-hair brush. After the application of any of these, a piece of lint slightly larger than the sore should be applied and retained in position. If the sore be beneath the prepuce, no special means are required for keeping the dressing in place; but if it be on the outer skin a piece of oiled silk should be applied over the lint, and a light bandage will be necessary. The diseased surface must always be isolated in order that accidental inoculation of the parts around and the consequent formation of fresh ulcers may be prevented as far as possible.

If the patient is a man he should be directed to support the penis in a suspensory bandage or handkerchief against the abdomen, never to let it hang down, and to be particular that the dress is loose enough not to chafe the parts in walking. Care is particularly necessary in women, whose genital organs are difficult to dress. Strips of lint should be laid between the labia and nymphæ on each side, and in the folds of mucous membrane round the vagina. The œdema of the vulva, which is so common with chancres, is best managed by allaying the irritation with frequent washing and by lying down.

If the sore is indolent, and shows no tendency to heal, it should be dressed with some weak astringent solution, acetate of lead, sulphate of zinc, or nitrate of silver, from one to four or five grains to the ounce of water; or a lotion of five or ten grains of tannin to the ounce of water; or black or yellow wash, are all useful in stimulating the sore to granulate if the first-mentioned applications do not answer. Calomel or red precipitate may be dusted over the surface with advantage in some cases. Solutions of a caustic strength should not be continually applied, as they only increase the irritation and spread of the sore. When used at all they should be strong enough to produce an eschar at once. Creeping sluggish sores are often induced to granulate freely by dressing them with a lotion of tartarated iron (F. 27). If means of this kind fail to excite cicatrisation, it is better to destroy the surface thoroughly with caustic.

Caustic may be employed on the very first appearance of a sore, to shorten its duration, and to prevent the danger of inflammation, sloughing, multiplication by consecutive inoculation, or bubo. At this time the sore is also very small, and the pain accompanying its extirpation not very great. But when the patient has had the ulcer a week or ten days before he comes under treatment, the chancre has generally assumed the character it means to preserve; if it appear little prone to spread and inflame, it may be managed by the appli-

cation of iodoform without resorting to caustics. If the sore, on the other hand, be spreading, with sharply-cut edges, or if it have lasted a long time, and resist other treatment; or, again, if its presence prey upon the patient's spirits, cauterisation is the best remedy to prevent further mischief. In the rapidly sloughing chancre with inflammation, complete cauterisation with the galvanic cautery, Paquelin's thermo-cautery, or the hot iron, is the most effectual remedy, but it must be followed by soothing applications to allay the subsequent pain and inflammation.

As chancres may excite bubo at any period of their existence, destruction of their surface with caustic may prevent this consequence whenever it is employed. Still this advantage is not sufficient in practice to require the invariable use of caustics, as the chances of a particular sore not being accompanied by bubo are at least two to one, even when left to run its course. Besides this, it is often exceedingly difficult to destroy several sores thoroughly by one application of caustic; hence the patient, after having undergone all the suffering and inconvenience of cauterisation, may be disappointed on finding the sore assume its original character in a few days. In the section on Syphilis the use of caustics to prevent general constitutional infection has already been discussed and shown to be valueless for that purpose. Thus, caustics are useful to extirpate the sore on its first appearance, to check it when spreading, and to arrest its progress when sloughing rapidly; in other conditions, the inconveniences attending the use of caustics often outweigh their advantages.

Several preparations are used to destroy the ulcerating tissue. Whatever form of caustic is selected should always be thoroughly applied, and it is better to cauterise a little more deeply and widely than is absolutely necessary, that complete destruction of the sore may be ensured. Among the most effectual caustics is a mixture of charcoal and strong sulphuric acid, known as Ricord's paste (F. 59). It is a very effective remedy, not being liable to overflow the sides of the ulcer and attack the healthy skin, as is the case with liquid caustics. But it becomes inert by absorbing water from the atmosphere if kept long, hence it is less convenient than another—the strongest nitric acid. The best way to use this is to dab it with a glass brush over the floor and edges of the ulcer, and allow it to soak well into the surface of the sore for a few minutes before the excess of acid is neutralised with a little carbonate of soda dissolved in water. The skin surrounding the ulcer should be protected by vaseline, but the edges may be left clear for the action of the caustic. Chloride of zinc and caustic potash are slower in action, and must be left longer in contact with the sore, or they will not penetrate

deeply enough to destroy it altogether. When the caustic has done its work, and the excess has been washed away with cold water, the sore should be dressed with wet lint. The eschar usually separates in four or five days, and leaves a clean granulating surface.

Follicular Chancres sometimes present only a small external opening, so that the discharge does not escape freely. Under such circumstances, burrowing is liable to take place, and if the chancre be left to itself it lasts a long time and gives rise to much inconvenience. If the orifice do not quickly become wide enough to allow free exit to the discharge, it may be enlarged, and the cavity cleaned and dressed with iodoform paste, or, if this fail, caustic may be applied.

Chancres of the frænum are always very painful, and troublesome to treat. They often perforate or destroy the frænum. From the pain attending retraction of the prepuce also, the patient often neglects to cleanse them thoroughly or to apply the dressings accurately. If the sore be superficial and not spreading rapidly, and if it can be exposed without much difficulty, it should be treated in the same way as chancre elsewhere. If, however, the frænum have become perforated, time will be saved by completely dividing it. This may be most conveniently done by means of a ligature. Diday[1] uses a blunt pair of scissors, one blade of which has been heated in a spirit lamp, so that bleeding may be avoided.

Chancres at the margin of the prepuce often assume the form of chaps or fissures and are slow to heal, both from the great mobility of the part and also from their liability to irritation from the passage of urine over them. They should be carefully dressed with the iodo-carbon paste, and the patient must be cautioned not to retract the prepuce further than may be necessary for the application of the dressing. A piece of lint or cotton-wool must be placed within the free border and changed each time after passing water. If these means fail, nitric acid or Ricord's paste should be applied, after which the sores usually heal rapidly. When these fissures are deep, and especially if there be much loss of tissue, contraction of the preputial orifice frequently occurs after cicatrisation. If the amount of narrowing be sufficient to prevent exposure of the glans, some one of the operative measures described in the Treatment of Phimosis will be necessary.

Chancres beneath the prepuce with phimosis must be treated by syringing weak astringent or antiseptic lotions (F. 20, 21) between the glans and the foreskin from three to six times a day according to the amount of discharge. If the prepuce become inflamed, the

[1] Diday : Thérapeutique des Mal. Vén., p. 178.

patient must be kept lying down and evaporating lotions applied while the syringing is steadily carried out every two hours. If the parts become too much swollen to allow of the use of the syringe the case must be treated according to the directions given in the section on Phimosis.

Chancres of the meatus urethræ are often long in healing, owing to the irritation caused by the passage of urine over the raw surface. Powdered iodoform or the iodo-carbon paste should be applied, and a shred of lint inserted between the lips of the meatus. The dressing must be renewed after each act of micturition. Sores in this situation, unless very shallow, are always followed by more or less contraction of the orifice.

Chancres further down the urethra must be excessively rare, and none have come under our observation unless by extension downwards from the orifice. In such a case salines and diluents should be given so as to render the urine as little irritating as possible. A solution of sulphate of zinc (half a grain to the ounce) should be injected once or twice a day, and a bougie passed from time to time, as soon as it can be borne, for stricture will be sure to follow cicatrisation.

Chancres of the anus and rectum are very difficult to keep clean. They should be bathed several times daily, particularly after each action of the bowels, which should always be regulated by laxatives, such as castor oil, or confection of senna, in order that the fæces may be kept as soft and unirritating as possible. Locally, the iodo-carbon paste is an excellent application. If the ulceration extend into the rectum, iodoform suppositories (F. 84) or an ointment of iodoform (F. 57) should be used. If contraction follow the cicatrisation of sores in this situation, the ordinary treatment of stricture by the passage of bougies must be resorted to; but if it be extremely narrow, rectotomy may be necessary.

Inflamed Chancre.—When a chancre is simply inflamed—that is, painful, hot and secreting much pus, and the surrounding skin red and tense, the patient should be kept lying down and a cooling lotion (F. 20) should be constantly applied. A good purge should also be given, and the diet must be moderate. If the inflammation be not quickly subdued by these means, recourse should be had to immersion in the manner to be presently described.

Treatment of sloughing Phagedæna.—When the destruction of tissue is so rapid as to cause sloughing phagedæna, prompt measures must be adopted for the arrest of the morbid action. For this purpose destruction of the surface of the sore by means of caustics or the actual cautery is the treatment usually employed. Of late years, however, the more or less continuous immersion of the patient

in warm water as practised by Hebra in Germany, and by Hutchinson[1] and others in this country, has in our hands been successful in many cases in arresting the progress of phagedæna. Consequently, in any case where immersion can be properly carried out, a trial of that method of treatment should be made before having recourse to the more severe proceeding of destruction of tissue by the cautery. The immersion plan of treatment may be conveniently carried out in the following way :[2]

The patient sits for eight or ten hours a day in an ordinary hip-bath, containing sufficient water to ensure constant submersion of the affected part. The temperature of the water is regulated by means of a thermometer, and is kept as near 98° F. as possible by the removal and addition of small quantities of water at frequent intervals without disturbing the position of the patient. The exposed parts of the body are covered with blankets ; and in winter the bath is placed near the fire. In the evening some preparation of iodoform or other dressing, such as a lotion of tartarated iron and opium, or of carbolic acid, is applied, and the patient goes to bed as usual. Next morning the dressing is allowed to separate in the bath, the pain attending its removal being thus avoided. The bath is repeated day after day as long as may be necessary. If the sore be seen in an early stage, a few days' treatment will often suffice to restore it to a healthy condition ; but in severe cases of phagedæna the bath will have to be continued for a much longer period. Immersion should always be persevered in for several days after the morbid action has ceased ; indeed in many cases it may be continued with benefit until cicatrisation of the sore is advanced. One of the great advantages of this method is that the severe pain attending phagedæna is nearly always greatly relieved, and the further spread of the disease arrested. If immersion during the day only do not suffice, it should be continued both day and night. In addition to simple immersion, Hutchinson recommends that the patient be supplied with an irrigator, by which a forcible stream of water can be directed on the sore while he sits in the bath.

When the destruction of tissue is not arrested by immersion, the whole surface of the sore must be thoroughly destroyed by some strong caustic or by means of the galvanic cautery, or Paquelin's thermo-cautery, or by the hot-iron. If the diseased surface be of small extent, the acid nitrate of mercury, or strong nitric acid, or

[1] Hutchinson : Brit. Med. Jour. 1872. Vol. ii., p. 497, and Med. Times and Gazette. 1877. Vol. i. p. 385. See also Simmons : New York Med. Record. 1875, p. 612 ; and Coulson : Med. Examiner. 1877, p. 350.

[2] Arthur Cooper : On the treatment of unhealthy local and syphilitic sores by immersion. Lancet. 1879. Vol. i., p. 731. Baths specially constructed to maintain a constant supply of warm water are now made for this purpose.

Ricord's paste may be employed; but whenever the surface is large the actual cautery is indispensable.

The patient should be put under ether or chloroform, and the sore cleared of all loose sloughs. The surface of the ulcer should then be dried, and the surrounding parts thoroughly cleansed with carbolic lotion (1 in 20). The cautery may now be passed evenly over the sore and along its edges till all the inflamed and ulcerating tissue is charred. This must be done deliberately and carefully, or the sloughing will begin again in a few hours. The pain may be allayed by wrapping the part in rags dipped in ice-cold water for the first few hours after the operation. When the aching has subsided, a warm linseed and charcoal poultice may be applied to hasten separation of the eschar. As a subsequent dressing, a saturated solution of boracic acid is often very useful. When the surface has become quite healthy the sore may be treated as an ordinary ulcer. But if phagedænic action reappear, cauterisation must be repeated; or, if that be not considered advisable, iodo-carbon paste, a lotion of tartarated iron, or a saturated solution of permanganate of potash may be tried.

Slight *bleeding* from a phagedænic chancre may be treated by the application of perchloride, or, what is better, of persulphate of iron, or a saturated solution of tannin. A pad and bandage to exert a sufficient amount of pressure should then be applied. If this do not soon stop it, more energetic measures, such as the actual cautery, must be resorted to, for patients with phagedæna cannot afford to lose much blood. If hæmorrhage occur during the treatment by immersion, the bath must be left off until the bleeding has ceased.

Patients with sloughing phagedæna are usually exhausted and in a depressed nervous irritable condition; they need rest in bed, quiet, tonics, and sedatives (F. 31). Tartarated iron also is often of great value in cases of phagedæna; it may be given in doses varying from ten to twenty grains with a little ammonia every three or four hours. Under immersion little or no opium is needed in many cases; but in others, and especially after cauterisation, tolerably large and frequent doses are necessary. The diet should be nourishing—milk, strong beef-tea, eggs, soups and, when the tongue is clean, more substantial food. When the sloughing is produced by contagion in overcrowded wards, plenty of fresh air is absolutely necessary, besides separation of the patients attacked with sloughing. Intercurrent complications must be treated in the ordinary manner.

Treatment of serpiginous ulceration.—This slow destruction is often controlled by iodoform, iodo-carbon paste, iodide of starch, or by glycerine and calomel in equal parts. These should be applied

thickly over the surface and renewed twice daily. The administration of large doses of tartarated iron, and the local application of a strong solution of the same salt (F. 27), is strongly advocated by Ricord, and answers well in some instances. If none of these plans succeed, the treatment must be similar to that just described for sloughing phagedæna. The patient requires good food and good air, tonics, and sometimes opium. If he be syphilitic, remedies directed against that disease should be administered; for some cases which resist all other modes of treatment yield quickly to large doses of specific remedies.

Treatment of Bubo.—If the patient apply for relief in the earliest stage, that is when there is only slight pain and but little swelling in the groin, the treatment may be preventive, and if the irritation be only of the simple or sympathetic kind, a favourable result is not infrequently attained. The patient must desist from exercise, if he have not already done so for the sake of his chancre. If he can be induced to lie in bed altogether, so much the better; if not he must rest as much as possible. The diet should be moderate without stimulants, and a purge is always useful to begin with. All irritating or stimulating treatment of the chancre must be avoided. A lead and spirit lotion (F. 20) may be applied to the swelling, and the dressing changed frequently. Keyes[1] has seen benefit from the application of a mixture of tincture of belladonna and tincture of aconite, by means of a camel's-hair brush, several times daily.

Zeissl[2] and Patzelt[3] recommend the following plan of treatment. They state that by maintaining moderate pressure with compresses soaked in solution of subacetate of lead, the skin over the swollen glands in a few days loses its doughiness; not infrequently fluctuation, if it have been present, disappears, and the glands gradually subside. When the pus is very near the surface, fine punctures with a tenotome to allow it to soak away gradually into the compress will often prevent much destruction of the skin and burrowing of matter. Out of more than 100 cases, Zeissl found that very few were disfigured by any scar. In thirty-three out of sixty-seven cases recorded by Patzelt, subsidence occurred without suppuration.

When the glands are swollen and painful, cold applications often aggravate rather than relieve the pain, and fomentations, which should be as hot as can be borne, and frequently renewed, must be employed. The application of a mixture of belladonna and glycerine over which a poultice may be applied, also gives great relief when the pain is severe. Not infrequently these precautions suffice to

[1] Keyes: Venereal Diseases. 1880, p. 48.
[2] Zeissl: Wien Med. Woch. 1872, p. 221.
[3] Patzelt: Archiv für Derm. u. Syph. 1873. 3 u. 4 Heft.

allay the irritation when it is not due to absorption, but so favourable a result does not always follow, and more energetic measures must be adopted.

Bleeding by leeches applied to the bubo itself is now and then required, when the pain is very violent and the local congestion high. The flow of blood should be maintained by applying five or six leeches first, and replacing them as they fill, until ten or a dozen have been applied, according to the strength of the patient. Leeches are worse than useless when suppuration has begun, for they cannot prevent it, and if their bites are unhealed when the abscess breaks, each of the little wounds may become a chancre. When the swelling has softened, and suppuration has set in, the passage of the pus to the surface should be hastened by poultices of linseed meal, and fomentations. If cold have been previously used, the change to warmth must be gradually made, lest sloughing of the skin result from too hasty an elevation of temperature.

Pressure is of signal service to indolent slowly forming buboes, which are composed of enlarged glands and congested cellular tissue with little tendency to degenerate into matter. Steady compression will often disperse them without suppuration. The pressure is applied by adjusting a thick pad of cotton wool or folded lint over the swelling, and confining it by a firm spica bandage or by strips of plaster carried round the body and thigh. An elastic bandage sometimes answers well in these cases. A greater degree of pressure may be readily obtained by the application of a bag containing a varying weight (from half-a-pound to two or three pounds) of shot. To obtain a good effect, the patient should wear the pad in bed for four or five days if it lessens the pain, but if that increases, the pressure is too late, and must be replaced by warm fomentations. In addition to simple pressure, plasters of iodine, belladonna, or mercury spread on leather, may be applied to the swelling underneath the pad; or the bubo may be painted with solution of iodine dissolved in glycerine in the proportion of a scruple to the ounce.

When buboes have been opened, and are non-virulent, the closure of the abscess is greatly hastened by applying pressure over the dressings, which of course must be renewed as often as may be necessary to maintain cleanliness.

Vesicants are very serviceable at various stages of the bubo's progress, but most advantageous when the glands remain enlarged after the chancre has healed. A common mode of applying counter-irritation is to paint the part with a solution of ʒj of iodine to the oz. of spirit, from which a blister rises. The enlargement often disappears rapidly after a few repetitions of this application.

Incisions are sometimes useful to relieve the tension of the

swollen glands before pus has actually formed, but should always be made as soon as the swelling softens, for the pus must come out, and burrowing of matter under the skin is lessened by giving it free exit. If the abscess point at one place a free vertical incision answers best, unless the bubo extend widely along the fold of the groin, in which case it may be freely opened in that direction. Cotton wool or a strip of lint should then be inserted, and a poultice may be applied until the smarting pain caused by the incision has subsided. Subsequently, water dressing or a lotion of sulphate of zinc (one or two grains to the ounce) may be used according to the state of the wound.

If the bubo point at several places a rapid cure may often be obtained by puncturing each fluctuating spot with a tenotomy knife, pressing out the pus, and passing down to the bottom of the incision a piece of suture silk or a few threads of lint moistened with the strong Liquor Plumbi. A pad of cotton wool should then be applied and secured with a spica bandage. The threads become loose in a few days, when they should be removed; but the compress and bandage must be continued until healing has taken place.

When the abscess has already burrowed, several small openings should be made, and a few threads or a fine Chassaignac's drainage tube carried along from one opening to the other. The pus soon drains away through these channels, into which a daily astringent injection may be made, and the dressings covered by a compress; large buboes often shrink rapidly under this treatment.

If sinuses pass in many directions through the cellular tissue, the patient must be put under ether or chloroform, and the tracts opened freely with a director and bistoury; the soft granulation tissue should also be scraped away with a sharp spoon. Afterwards the channels must be filled with dry lint or wool, until suppuration begins. Sometimes a mass of enlarged glands remains at the bottom of the wound; red precipitate powder may be sprinkled over them daily, and pressure applied by means of a pad and bandage. If this treatment do not succeed, the glands may be removed with a sharp spoon, or they may be destroyed by caustic, and the wound well poulticed, when granulations will speedily set in. Any borders of skin which overhang the wound and are much undermined may be cut off with scissors.

The constitutional treatment of bubo depends entirely on the condition of the patient. If he be debilitated, good food, tonics, and fresh air, together with the application of ordinary means for restoring the strength, should be resorted to. Iron and cod liver oil are often very useful. He should be particularly cautioned to avoid all but very moderate exercise until his bubo is dispersed or healed.

If the bubo be *virulent*, and after being opened is converted by the contagious virus into a chancre, the treatment must be similar to that of a chancre, and not that of an ordinary abscess. The iodo-carbon paste is a very useful dressing, as it can be readily adapted to the uneven surface of the sore. It should be applied twice or three times daily according to the amount of the discharge, care being taken to work the paste thoroughly under the edges of the sore, which are undermined and irregular. Immersion also is a very soothing and effective plan of treatment. It should be carried out according to the directions given for phagedæna, but a full-sized bath in which the patient can lie down is generally advisable. If in spite of this the bubo become phagedænic and spread rapidly, caustics or the galvanic or actual cautery must be resorted to. Owing to the great size of the new chancre, one application sometimes fails to destroy the sore entirely, in which case the caustic may be repeated. The open wound must then be treated according to its condition, by iodoform or stimulating lotions or ointment, and pressure with a compress and bandage.

Certain authors, especially Auspitz,[1] pretend that the enlarged gland in an early stage may be distinguished from simple bubo by its hardness and elasticity, and that puncture followed by breaking up the gland tissue with a probe at this time, may prevent the further progress of the bubo. We do not know of any certain means of distinguishing the simple from the virulent bubo in the early stage; consequently we have never carried out the treatment advocated by Auspitz and others.

[1] Auspitz: loc. cit., p. 496.

DIVISION IV.

GONORRHŒA.

CHAPTER I.

Synonyms.—Clap; Blennorrhagia; Blennorrhagie; Chaude-pisse; Tripper.

Definition.—Gonorrhœa is contagious purulent inflammation of certain mucous membranes. A breach of surface is not necessary for contagion. Contact of gonorrhœal pus with the healthy mucous membrane suffices to convey the disease.

General Sketch.—The primary seat of gonorrhœa is, in man, the fore part of the urethra, in woman the fore part of the vagina. From these it may spread over the whole mucous membrane connected with its starting point. Further, if its discharge be applied to the mucous membrane of the eye or of the rectum, a similar inflammation is there produced. In its course gonorrhœa often leads to complications of two kinds. The first consists in extension of the inflammation to other parts—the prostate and neck of the bladder or the uterus for example. In the second group the effect of the irritation is seen at a distance, and shows itself in rheumatoid inflammation of joints, or of the eye.

The question of the specific nature of gonorrhœa is one that has been long debated, and indeed, is not likely to be ever removed from the list of debatable questions. For this reason; that inflammation of the urethral or vaginal mucous membrane, sometimes indistinguishable from gonorrhœa in its course and results, is continually met with, without any evidence or suspicion of specific contagion. This fact and some others which will appear in the description of the causes of urethritis, indicate that contagious urethritis and vaginitis may be generated *de novo*. For these reasons it is safest to agree with Ricord, that almost any disordered condition of the female genitals may, under certain conditions, excite inflammation of the urethra in

the male. The importance the condition of the individual plays in the production of urethritis explains the common observation, that a man may have urethritis after intercourse with a married woman whose husband is never attacked; also that a man may have intercourse habitually with a woman suffering from leucorrhœa with impunity, though he now and then has a smart attack of urethritis after coitus. On such occasions he has been more excited than usual, has been drinking, has used an injection after intercourse; or has in some other way stimulated the urethra into such a condition that very slight irritation suffices to set up inflammation.

But there still remain certain peculiarities which characterise gonorrhœa, and which can be satisfactorily accounted for only by believing in the existence of a virus which has the power of setting up inflammation of certain mucous membranes by simple contact with them. So virulent is this pus, that a very minute quantity suffices to set up severe inflammation in a perfectly healthy person without any adjuvant. The period of incubation which elapses between contagion and the appearance of the discharge, the general characters of gonorrhœa, and the long array of symptoms, similar in all who suffer from the disorder, are also in favour of the existence of a virus. When urethritis or vaginitis, independent of specific contagion, follows intercourse in either sex, there is always some other adjuvant, besides mere sexual contact. Either one or other person is out of health, has been indulging freely in alcoholic or other excesses, or has in some way rendered the secretions abnormally irritating. To such cause is also usually added the additional irritation of excessive sexual excitement and indulgence at the time when the discharge is contracted. On the other hand, one single occasion of sexual commerce will, if one of the parties be affected with gonorrhœa, almost certainly excite the disorder in the other. Finally, it must not be overlooked that the urethra is often exposed to contact with pus of certain kinds without undergoing inflammation. For example, chancrous pus, pus from prostatic abscess, cystitis and pyelitis, pass over the mucous membrane of the urethra without causing urethritis. Pus from the uterus or from a pelvic abscess also frequently remains in contact with the vagina without setting up vaginitis. These facts are strongly in favour of the existence of a specific virus in gonorrhœal pus, which gives to it a peculiar noxious influence over the urethral, vaginal, and some other mucous membranes. Thus, while there is great probability that true gonorrhœa depends on the action of a special contagious element, the clinical distinctions of urethritis or vaginitis so caused are insufficient to enable us in all cases to distinguish that affection from urethritis or vaginitis produced by irritation of other kinds.

Several observers have of late announced the discovery of certa *micrococci*, which they believe to be peculiar to gonorrhœal pus, a to be the cause of the peculiar virulence of the gonorrhœal dischar Neisser[1] and Weiss[2] have published papers on this subject, and bo these authors affirm that they have never found similar organisms the pus obtained from sources free from gonorrhœal taint. In sp of these assertions, however, the discovery of the essential eleme of gonorrhœa can by no means be taken as proved; more especia as many competent observers have been unable to find anything gonorrhœal pus by which it can be distinguished from that procu from other sources.

With regard to the propagation of gonorrhœa to animals, t following experiments may be mentioned:—

Horand and Puech[3] inserted some gonorrhœal pus from a m into the urethræ of two healthy dogs. In both cases a urethri appeared on the fourth day. The same experimenters filled t vagina of a bitch with gonorrhœal pus. The next day a dischar appeared, but only lasted two days. From these and other expe ments the authors' conclusions are:—(1) that although gonorrh can be inoculated on dogs, it only causes in them a urethritis of lit intensity and of short duration. (2) That the gonorrhœal pus man is not inoculable on the ocular mucous membrane of the do Rollet,[4] however, succeeded in inoculating gonorrhœal pus on the e of a young rabbit, but he failed to produce any effect by introduci it into the vagina of a bitch.

[1] Neisser: Centralblatt für die Med. Wiss. 1879, Juli 12, p. 497.
[2] Weiss: Thèse de Nancy, 1880; and Gazette Hebdom. 1880, Nov. 12.
[3] Horand et Puech: Annales de Derm. et de Syph. Vol. iv., p. 384.
[4] Rollet: Maladies Vénériennes. 1865, p. 205.

GONORRHŒA.

CHAPTER II.

URETHRITIS.

URETHRITIS is by far the most frequent venereal disorder among men. Of 1182 male patients at the Midi Hospital in Paris, 683 had urethritis,[1] and a similar proportion prevails among the patients at the London Lock Hospital.

Urethritis has two main causes. First, *Contagion*. This is the most frequent cause of urethritis. Secondly, *Excessive irritation of the urethra*. This may be produced by many causes, the most important of which are, excessive intercourse and excess in alcoholic drinks, or the constitutional diathesis of gout. Local irritation of the genitals, such as the passage of instruments or calculi, the use of injections after coitus, or masturbation, may also cause inflammation of the urethra. Again, the injection of irritating fluids into the urethra may produce a urethritis quite as severe as that caused by contagion. In illustration of this, Swediaur's[2] well-known experiment may be mentioned. That physician injected a solution of ammonia into his own urethra, and thus produced a violent purulent discharge that lasted for six weeks.

Many of the consequences which follow urethritis set up by contagious discharges, may be also observed in the course of non-venereal urethritis. For instance, the passage of a catheter or calculus may produce inflammation of the urethra, complicated with abscess or prostatitis, even epididymitis and arthritis. Persons of the scrofulous and lymphatic temperaments are more prone to catch and suffer more severely from urethritis than others. Certain individuals, for no particular reason that can be discovered, never have intercourse without some discharge afterwards; others, on the

[1] Fournier: Article Blennorrhagie, Nouveau Dictionnaire de Médecine et de Chirurgie pratiques, p. 130.

[2] Swediaur: quoted in full by Rollet: loc. cit., p. 204.

contrary, however much they may expose themselves, seldom contract urethritis. Thus, *venereal urethritis*, the variety at present under consideration, may, under the conditions already enumerated, follow contamination with: (1) the discharge of vaginitis or urethritis in the female, set up by contagion with gonorrhœal matter. (2) Acrid discharges secreted by women in various disordered conditions, not the results of gonorrhœal contagion, such as uterine catarrh, the menstrual flux, vulvitis, &c.

Seat.—Beginning at the first inch of the urethra, especially affecting the fossa navicularis, the inflammation spreads onwards, and, though it usually pauses at the bulbous part, may extend through the whole of the urethra to the neck, and even the interior of the bladder. The ureters and pelves of the kidneys are stated to be sometimes attacked also.

The seat of the inflammation varies with its progress. At first, the redness and congestion do not extend beyond the fossa navicularis; but they soon proceed downwards, either continuously, or by pauses and onward starts, so that the intensity of the congestion varies from day to day. After a short time, if the urethra be examined with the endoscope, the fore part will be found to have lost its congestion and redness, while the disease is still active further down. Small very shallow ulcers are also sometimes seen; they bleed freely as the tube passes over them. When the bulbous part is reached, the inflammation often stops and lessens in severity. During this decline it holds obstinately to one or two points, generally at the bulb or near the fossa navicularis. At these places it sinks deeper, attacks the submucous tissue and mucous follicles, and causes chronic congestion and induration, which alter the aspect of the urethra, and produce changes of different kinds, which will be described in connection with gleet.

The symptoms of urethritis may be divided into three stages: 1st, those of irritation and congestion of the mucous membrane; 2nd, those of active inflammation; 3rd, those of subsidence and chronic discharge. Before the signs of irritation begin, there is an interval after contagion which varies from two to eight days. The interval is short in those who are liable to discharge after coitus, or who have had gonorrhœa before, and longer in those who contract it for the first time; in such persons four to five days is the ordinary interval before the premonitory symptoms appear. These begin with a little tickling at the end of the passage, which at first is not unpleasant. The meatus is somewhat swollen, and usually a slight viscid discharge exudes from it, gluing its lips together. This condition lasts two or three days, and is then succeeded by acute inflammation.

The second stage begins with much redness and swelling of the mucous membrane, and pouting or eversion of the lips of the meatus urinarius. The glans penis swells and the discharge grows purulent, thick, yellowish green, and abundant. In about a week these symptoms reach their height, when the penis is swollen, and very tender; the glans is often of a dark-red colour, and the veins are full and turgid. The urethra, from the congestion of the corpus spongiosum, feels like a hard cord, sometimes slightly knotted as far as the inflammation has proceeded. The pain at this time is very severe, and consists of a sensation of heat in the inflamed part, with aching and dragging in the groins, testes, and loins. Micturition is slow and painful, causing a violent scalding that lasts for some time after the urine has been voided. This pain is first felt at the meatus, but as the inflammation descends the urethra, it moves down lower and lower. The stream is altered, being either smaller and weaker than before, or the urine comes only by drops; even retention may take place through the swelling and dread of pain. The general system, especially in young persons, is disturbed; there is mental depression or weariness, and occasionally pyrexia—heat and chills, thirst, nausea, quick pulse, and other signs of fever. When the inflammation has reached the bulbous part, weight and tenderness in the perinæum are often complained of. The necessity to rise and make water is frequent at night, and the rest is disturbed by involuntary erections of the penis from reflex irritation.

These erections usually occur soon after the patient has fallen asleep, and are exquisitely painful. The penis is often twisted or bent downwards, giving rise to the condition termed *chordee*. This is caused by congestion and exudation of plastic lymph into the corpus spongiosum, which prevents its distension and thus occasions the characteristic curved form assumed by the penis. Chordee in many cases lasts only for a few minutes and is relieved by micturition; not infrequently, however, the painful erection lasts much longer, and other means are necessary for its relief. The erections occur again and again during the acute stage of gonorrhœa, and sometimes continue even after the chronic stage is reached.

According to Hilton,[1] when the erection occurs suddenly the cause is spasm of the muscles which control the blood supply to the penis, the spasm being due to irritation of the branches of the pudic nerve, which are also distributed to the inflamed mucous membrane of the urethra. The sudden and severe erections which occur during sleep are attributed by the same author to excito-motor action roused in the spinal cord when it is deprived of the control of the brain. Hilton also suggests that the greater distension of one side of the

[1] Hilton: Lectures on Rest and Pain, 2nd edit. 1877, p. 255.

penis than of the other which often occurs may depend upon a greater amount of irritation on the corresponding side of the urethra. The variety of chordee which is produced by the effusion of inflammatory products into the corpus spongiosum is considered by him to be quite distinct from the preceding forms.

Deformity of the penis during erection sometimes becomes more or less permanent through inflammation of the erectile tissue; this will be mentioned again among the complications of urethritis.

Third stage.—After seven to fourteen days of the acute stage all the symptoms improve; the inflammation subsides, the swelling and hardness disappear; the chordee grows less violent and less frequent; micturition is again free and causes less pain; but the discharge, though less, is still greenish and thick. By the end of another week the pus has become whiter, much less abundant, and the other symptoms have almost disappeared. A little tickling and occasional smarting often continue till every sign of disease has vanished.

Naturally, urethritis subsides in a few weeks and leaves no trace of its presence; but this termination is not often attained, for various reasons. If the patient neglects the precautions he has observed during the acute stage, the scalding and discharge are very apt to return. Long continuance of the discharge, whether it be copious and purulent, or scanty and thin, and frequent relapse in severity of the inflammation, are usually due to the patient's disregard of his directions, or to improper treatment of the disease. Repeated irritation of the urethra by intercourse, erections, and seminal emissions is also a common cause of relapse. Patients should always abstain from coitus, or from whatever is likely to produce sexual excitement, for some time after the discharge has ceased; because remnants of congestion still remain, and easily inflame again if irritated by excess. Stimulating articles of drink and food, especially strong wines, beer, spirits, and strong coffee, cannot be borne with safety for some weeks after the discharge has stopped. Asparagus, and highly seasoned dishes are particularly irritating to the urethra. Dancing and riding are also extremely likely to bring on a discharge again after it has apparently ceased. In the same way a long railway journey when taken while some discharge remains, may cause a gonorrhœa to return with its first violence.

Ill judged efforts to cure the disorder not infrequently prolong or revive the discharge. If the patient is naturally weakly, or obliged to continue his occupation, purgation, low diet, and sudorifics sometimes lower him so much, that the urethritis lapses into chronic gleet. On the other hand, the use of injections of too

great strength or in unsuitable conditions of the urethra, may certainly cause a return of the discharge. It happens not infrequently that the patient, by his unceasing efforts to cure his disease with one remedy after another, keeps up a congested state of the urethra sufficient to furnish a little mucus every time he presses the canal. Such a discharge will often cease if he lets it alone, and diverts his mind for a week or two at the sea-side. Again, the oftener the discharge is reproduced, whether this happen through neglect or unsuitable treatment, or through fresh contagion, the more difficult it is to cure.

Variations in the course of Urethritis.—The foregoing description applies to the majority of well-marked cases, but from this typical representation there are often departures: for example, the discharge is sometimes the first notification to the patient that he has contracted the disease, for the swelling and pain are sometimes very slight for a day or two. In other cases, the tenderness, scalding, and swelling occasionally continue for a few days before the discharge appears. The intensity of the inflammation varies very much. The first attack is commonly the most severe one, but the severity is dependent in some measure on other circumstances, especially on individual peculiarity. The patient's habits with regard to temperance in alcoholic and venereal indulgence, and his state of health at the time of infection, greatly influence the intensity of the inflammation. Middle-aged men generally have gonorrhœa less acutely than youths, and persons who suffer from acne usually have the disease severely and obstinately.

Terminations.—There are several ways in which urethritis subsides. The first and most frequent is gradual disappearance of the symptoms of the chronic stage. In a certain number of patients the discharge soon becomes very much lessened, but the scalding on micturition and chordee remain. In such cases the mucous membrane is generally bright red, and the urethra is tender if pressed between the finger and thumb. If the patient be questioned, some irregularity on his part will generally be admitted. He has been riding, playing cricket, or has not been sufficiently abstemious in respect of wine and spirits. In another patient the discharge may remain abundant and thick without pain or scalding for months, and in very rare cases even for years, before it subsides. This form is mostly found in persons of gouty constitution.

Gleet.—A common termination of gonorrhœa is termed *gleet*, by which is meant the persistence, often in spite of various treatment, of a scanty, thin, pale white discharge from the urethra. Sometimes the quantity is sufficient to afford a drop whenever the urethra is pressed, at others a drop of matter is obtained only in the

morning, on rising from bed, or there may be only a little continua moisture with a drop of pus now and then. A very characteristi sign of the condition of the deeper part of the urethra, whe the discharge is too scanty to appear at the meatus in the ordinar way, is the presence of little threads of clotted discharge in th urine. The sensations felt by the patient at this stage of his disease rarely exceed a little occasional itching and smarting. A slight but obstinate discharge is often the only outward sign of the formation of an organic stricture, which, growing slowly and imperceptibly, will eventually cause much trouble. There is another danger, too: the state of the patient's mind induces him to constantly examine his genital organs; he grows morbidly anxious about himself, becoming, it may be, hypochondriacal and unable to pursue his occupation in life, or enjoy society: he is rendered miserable by the dread of various evils, real and imaginary; and in this condition he becomes desperate, and a willing victim of quacks and charlatans.

The anatomical changes in the urethra which give rise to gleet may be classed as follows:—1. Excoriations or shallow ulcers. 2. Inflammatory patches. 3. Simple vegetations or warts. 4. Inflammation of the glands and follicles of the urethra. 5. Certain conditions of the prostate.

The exact nature of the lesion which may be present can, in some cases, only be ascertained with certainty by means of the instrument called the urethroscope, or endoscope. Of late years the inspection of the urethra has been much facilitated by the improved construction of this instrument. Its more recent modifications have been simplified, so that the light can be thrown to the bottom of the tube by the ordinary frontal mirror. These simpler forms have now superseded the earlier and more cumbrous contrivances of Desormeaux, Cruise, Warwick, and others. Grünfeld,[1] who has written an exhaustive treatise on the endoscope, uses a simple straight tube. Auspitz[2] has invented a dilating endoscope. The glowing platinum wire has been also used for illuminating the urethra and bladder. This is the source of illumination in the complicated apparatus known as the Nitze-Leiter endoscope, which is fully described in Grünfeld's work.

1. *Excoriations* or shallow ulcers are occasionally seen in the fossa navicularis, or in the neighbourhood of the bulb. They are always very superficial, and present the ordinary appearance of similar lesions elsewhere. They are very sensitive, and the passage

[1] Grünfeld: Die Endoscopie der Harnröhre und Blase. Billroth's Deutsche Chirurgie. Lieferung 51. 1881.
[2] Auspitz: Vierteljahresschrift für Derm. und Syph. 1879, p. 14.

of the endoscopic tube usually causes more or less bleeding from their surface.

2. *Inflammatory patches.*—These are the commonest cause of gleet. If the urethra be examined with the endoscope, the greater part of the mucous membrane will be seen to be pale pink, but at one or more parts there is a patch of deep red colour. The most common position for such patches is the bulbous portion, that is, about 4½ to 6 inches from the meatus. There may be a patch also in the fossa navicularis, or, less commonly, in the portion of the urethra between this and the bulb. The red patches are less elastic than natural, and yield to the endoscopic tube less readily than other parts of the canal; consequently a little oozing of blood is frequently caused, and when this is wiped away the surface looks rough or raw. When gleet has lasted some months, the redness is not so deep in colour, and arborescent marking of the urethra with tortuous blood-vessels near the bulb is very common. This condition of the urethra is one that it is very important to ascertain, for the patches just described are really one of the early stages of stricture, and time only is needed for their conversion into fibrous contractile tissue. The surface of these inflamed patches sometimes becomes elevated into prominent granulations which are exceedingly difficult to cure. A granular condition of the urethra was formerly described by Thiry[1] and Desormeaux[2] under the name of *urethritis granulosa*, and was considered by them to be always due to specific contagion. This view, however, was never generally accepted.

The condition of the urethra which has just been described may usually be diagnosed with sufficient accuracy without the use of the endoscope. The patient should lie down, and a bullet-headed flexible bougie of a size that will just enter the meatus without pain, and with a slender graduated stem, should be passed slowly down the urethra. When it reaches an inflamed patch, a slight resistance will be felt by the surgeon, and the patient will complain of a smarting or burning until the bullet-head has passed the tender spot. The bougie should be pushed gently onwards into the bladder, any other tender spots being noted during its progress, and also during its withdrawal. The exact position of the patch is easily ascertained by noting the numbers on the stem of the instrument, or, if that be not graduated, by marking the bougie with the nail and afterwards measuring the distance on a rule.

3. *Vegetations or warts of the urethra.*—These are commonly situated at or just within the meatus. Less frequently they are

[1] Thiry: Presse Médicale Belge. 1858. And Recherches Nouvelles sur la Nature des affections blennorrhagiques. Bruxelles. 1864.

[2] Desormeaux: De l'Endoscope, &c. 1865.

met with in the fossa navicularis, especially about the lacuna magna; but in some cases they extend along the whole length of the urethra. Near the meatus the growths are often branched or arboriform, but lower down they form sessile or slightly pedunculated projections, identical in structure with those that grow on the external genitals. (See Accessory Venereal Disorders.)

4. *Inflammation of the glands and follicles of the urethra.*—This sometimes remains long after gonorrhœal urethritis has subsided. When the follicles in the anterior portion of the canal are affected, the discharge rarely comes from more than one or two of them. The lacuna magna is perhaps the commonest seat. In the prostatic portion, however, many of the crypts may furnish a discharge. Unlike the inflamed patches, these irritated follicles do not give rise to stricture. The only complication likely to arise is that the sinus or duct may close, and the pent-up secretion form an elastic swelling, which is easily felt in the penile portion. A small abscess is sometimes produced, which ultimately discharges into the urethra if not opened externally.

Gleet in patients who have hypospadias is very difficult to cure. This, in most cases, depends on the number of crypts or ducts about the end of the urethra, into which the inflammation extends. There is usually one on each side of the fissure just where, in the normal organ, the frænum is attached. They are sometimes three-quarters of an inch long, in which case they are quite capable of secreting a sufficient amount of discharge to stain the linen.

5. *Prostatic gleet.*—This will be considered under the head of Chronic Prostatitis.

The preceding description of the several conditions of the urethra which are observed through the endoscope,[1] or found post-mortem, is not considered sufficiently exact by some authors, and the several forms of urethritis have been divided into a number of separate groups. In our experience, however, these distinctions cannot be drawn with such precision as to warrant a more minute classification than has been given above.

Finally, it must be remarked that more or less gleety discharge is sometimes present when nothing abnormal can be made out, either by the passage of instruments or by direct inspection with the endoscope. In such instances the mucous membrane is generally pale and flabby, and the discharge is due to debility, either from some constitutional cause, or, in some cases, from the employment of a

[1] For a full description of the endoscope, and the lesions of the urethra rendered visible by its aid, see Grünfeld: loc. cit. Also, Desormeaux: loc. cit. Tarnowsky, Venerische Krankheiten. 1872, viii. Vorlesung. Gschirhakl: Endoscopie, &c. Mittheilungen des Wiener Med. Doct. Collegiums. 1879, Bd. 5, No. 25. Fenger and Hinde: Chicago Med. Review, Dec. 5, 1880.

too severe and lowering course of medication during the preceding urethritis.

Diagnosis.—The presence of urethritis in the acute stages is easily ascertained; the white or yellow or greenish matter which exudes from the orifice, the pouting lips and red mucous membrane of the meatus, are sufficient indications, without reference to the turgid condition of the organ, the smarting and aching pain, and other signs which frequently mark the course of acute gonorrhœal urethritis.

In the later stages, when the discharge has reached the minimum, the presence of urethritis is not always so easy to determine. Much assistance is gained from the patient's account of his disorder. There has been acute urethritis more or less remotely, and often of late he has observed a drop of matter at the meatus on rising in the morning: or the lips of the meatus are glued together by the dried discharge: or again, shreds of inspissated mucus are present in the urine. This scanty urethral discharge may depend upon the presence of chronic prostatitis, urethral fistula, stricture or some other sequel of gonorrhœa. These various conditions are to be distinguished by their history and symptoms.

Pus may ooze from the urethra in many affections, and thus cause them to be mistaken for urethritis.

Urethral chancre.—This form of chancre is close to the meatus, and can be seen either with or without the aid of a small aural speculum, as a well-defined sore. The discharge is sanious, and general congestion and painful erections are absent.

The initial lesion of syphilis is usually situate at the meatus, and from the swelling and redness which it causes, combined with a sero-purulent discharge, this affection has at first sight considerable resemblance to urethritis; but the firm induration, the blanching of the red swollen part when pressed, and the almost total absence of soreness, sufficiently distinguish an initial sore of the meatus from urethritis. In rare cases the sore is situate a short way down the passage, leaving only the discharge to indicate its existence: but it may be detected as a hard tender spot, seldom more than half an inch away from the meatus. This circumstance, and the multiple enlargement of the neighbouring lymphatic glands, distinguish the discharge it excites from that of urethritis.

A sero-purulent discharge without sore is occasionally met with in early syphilis. Such an affection is unlike acute urethritis in its scanty discharge and painlessness; but it may be difficult to distinguish it from a chronic gleet unless the urethra be searched with the endoscope. The syphilitic discharge is attended by very slight general congestion of the mucous membrane of the urethra, and soon subsides spontaneously.

Balano-posthitis may be mistaken for urethritis, especially if there be considerable phimosis. In such cases it is sometimes difficult to catch sight of the meatus urinarius behind the swollen folds of the free border, especially when the glans is also inflamed and bathed in pus. But the scalding in micturition is felt in the foreskin itself, while careful syringing under the foreskin will clear away the accumulated discharge, after which pressure of the urethra will not furnish a fresh supply of pus in balano-posthitis, as is the case in urethritis. It must be recollected, however, that gonorrhœal urethritis and balano-posthitis are often present together.

The distinctions between gonorrhœal and other forms of urethritis are less easily drawn. Certain characters, however, may be enumerated which form, on the whole, a satisfactory guide when they are present collectively. Those which distinguish gonorrhœa are :—the occurrence of an interval of several days between contagion and the appearance of discharge ; the red and swollen condition of the meatus, and the gradual extension downwards of the inflammation from that part ; the severity of the acute stage ; and lastly, if the woman from whom the affection has been contracted be examined, the presence of purulent vaginitis and probably also urethritis in her.

When a discharge is set up by simple irritation of a chronically inflamed patch, or stricture, it will be found to proceed from deeper down the urethra, and will probably be purulent from its first appearance. Such a discharge also quickly follows the exciting cause ; and is unaccompanied by inflammation and swelling of the meatus.

Diday[1] claims a distinguishing set of symptoms for that variety of urethritis which is caused by intercourse with a woman during the menstrual period. He terms it '*Urethrorrhœa*.' It appears two or three days after coitus, consists of a discharge accompanied by irritation, and lasts at least two months. The affection differs, he says, from gonorrhœal urethritis in that it begins with the same degree of intensity which characterises it all through ; the irritation never goes beyond a certain degree of tickling which is inconvenient rather than painful ; the discharge is clear, scanty, contains scarcely any pus, and is not affected by copaiba or cubebs. Diday thinks that this form of discharge corresponds to the non-virulent gonorrhœa of the old writers.

Another form of urethral discharge is attributed by Diday[2] and others to *herpes of the urethra*. The discharge is serous and scanty, attains its height in about forty-eight hours, and lasts about three days (never longer than a week). We cannot endorse this classification of Diday's.

[1] Diday : Thérapeutique des Mal. Vén. 1876, p. 58.
[2] Diday : loc. cit., p. 60.

In gouty urethritis, the discharge is usually white rather than yellow, and swelling of the anterior part of the urethra is absent or scanty in comparison with the amount of scalding and irritation of the bladder which are present. The scalding is also more frequently referred to the perinæal part of the urethra than to the orifice. The patient also has had other signs of gout, either as attacks of ordinary gout, or he is of full habit, has a dry itchy skin, is passing urine rich in uric acid, has lately been indulging freely in the pleasures of the table, or in some other way has roused his gouty diathetic condition into activity. Usually a much milder affection than gonorrhœal urethritis, gouty urethritis may be most severe. It is also liable to be attended by the same complications, especially affections of the eye and of the joints, as gonorrhœal urethritis. Hutchinson [1] mentions the case of a married gentleman who inherited gout and lived freely, who was under his care for several attacks of spontaneous urethritis. There was no suspicion of contagion, yet the discharge was most profuse, and it was impossible to distinguish it from an ordinary clap. With each attack the joints also were affected, and the eyes suffered so severely that repeated iridectomy was necessary.

In traumatic urethritis excited by instruments or the passage of a stone, signs of irritation immediately follow. Soreness or scalding accompanies the first micturition after the calculus or other foreign body has been passed; while discharge and swelling appear in twenty-four hours. In these cases affection of the testes or bladder may ensue, though not frequently, unless the patient be of gouty or rheumatic diathesis; but in such persons affections of the joints and fasciæ may also follow.

Certain Drugs are said to occasion a urethral discharge in some cases. St. Philippe [2] of Bordeaux observed the production of a very manifest urethral discharge in two patients who were taking considerable doses of arsenic. Asparagus is credited with the production of urethritis when largely eaten by certain persons. The diagnosis must depend in such cases on the history of the case and on the credibility of the patient.

Prognosis.—The prognosis of urethritis is favourable in most instances, if ordinary precaution is taken and no other acute disease is present; nevertheless, instances of fatal pyæmia are recorded. Death has likewise been caused by extensive inflammation of the kidneys, bladder, or prostate, with formation of abscess and urinary infiltration. In healthy men the first clap is ordinarily the most severe, but not always so. Speedy appearance of the symptoms

[1] Hutchinson: Medical Press and Circular, July 7, 1880.
[2] St. Philippe: Bull. Gén. de Thérapeutique, 15 Avril, 1878.

often indicates a short duration, if other conditions are equal. In gouty and scrofulous persons urethritis lasts longer, and more frequently degenerates into a gleet than in others. When an opinion is expressed as to the ultimate consequence of the inflammation, it must be borne in mind also, that stricture is a frequent result of gonorrhœa, and that the disease often lingers an indefinite time in the form of gleet.

GONORRHŒA.

CHAPTER III.

TREATMENT OF URETHRITIS.

THE treatment of urethritis may be either *abortive* or *systematic*. **Abortive treatment** includes methods of which the object is to cut short the disease before acute inflammation has supervened: that is, when the symptoms are confined to tickling at the meatus and a slight clear viscid discharge.

The various plans comprise the injection of strong caustic solutions into the urethra, and the administration of specifics, such as copaiba or cubebs, in large and frequent doses. The success which follows the employment of either of these methods is so small, while the dangers that attend them are so great, that we have abandoned them. If, however, the abortive treatment be employed, a solution of nitrate of silver (15 to 20 grains to the ounce of distilled water) may be used. Liquor potassæ, a solution of acid nitrate of mercury, chloroform, and other liquids have all been injected into the urethra with the same object.

If the solution of nitrate of silver be used it should be injected once, twice, or thrice in the twenty-four hours according to the violence of the effect produced. Very often one injection is sufficient, and more are useless or hurtful. The reason why abortive treatment is now generally discarded is that dangerous reaction is often induced by it. Violent gangrenous inflammation of the urethra, inflammation of the neck of the bladder, abscess of the prostate or in the perinæum, orchitis, bubo, and stricture have all been known to follow the use of caustic injections.

Large doses of copaiba or cubebs are also administered for the purpose of cutting short gonorrhœa, but besides being most uncertain in controlling the disease, they are very apt to excite congestion of the kidneys, or to cause violent vomiting and purging. Consequently the employment of specifics as abortives has also fallen into desuetude.

Another plan of cutting short urethritis in the early stages, while free from danger, is sometimes successful. It consists in the hourly injection of a weak astringent solution—for example, a solution of sulphate of zinc (½ grain to the ounce)—until twelve or fifteen injections have been made. A useful adjuvant to the astringent is belladonna, 5 or 6 grains of the extract being suspended in each ounce of the injection. The penis may also be smeared with extract of belladonna and glycerine in equal parts. The patient is best in his room or in bed while this treatment is being carried out. Low diet must also be adopted. If the treatment succeed, a cure is achieved in three days. If at the end of that time the discharge still remain, the plan must be abandoned and ordinary methods pursued. If also the injection cause increase of the discharge and scalding on passing water, it should be at once discontinued.

Systematic treatment, which has no pretence to cut short the disorder at the outset, but chiefly aims at curing it by allaying irritation of every kind, is often the most expeditious, as well as the best for the patient; and in the long run it is the safest for the reputation of the surgeon. In treating gonorrhœa careful regulation of the patient's habits and diet is most important. Abstinence from every kind of irritation must be insisted on, not only while the inflammation is acute, when the injunctions are readily complied with, but also for some time after the discharge has ceased. The patient must refrain from sexual intercourse, or sexual excitement of any kind; he must discard highly flavoured dishes, curries, asparagus, strong coffee, effervescing drinks, and beer. On the other hand, nothing is gained (except, of course, when the acuteness of the inflammation causes constitutional disturbance) by starvation. In delicate people, a small quantity of claret, well diluted with water, assists digestion, and furthers the progress towards recovery. Personal cleanliness must be rigorously observed, and the genitals frequently washed to remove the discharge as it collects.

Some sort of dressing must also be devised for keeping the discharge from the patient's linen. A handkerchief folded in four and attached to the inside of the shirt by two safety pins, answers very well and allows the discharge to flow away as fast as it is produced. The application to the meatus of a piece of lint or wool, which is kept in position by the prepuce, is injurious when the running is profuse, as it confines the discharge within the urethra; but it is a very convenient form of dressing when the discharge has become scanty. Various contrivances, such as an india-rubber bag attached to a band round the hips, are sold, but have the disadvantage of keeping the penis too hot, otherwise they are very convenient. If used, some absorbent cotton wool should be placed in the

bag, and some holes made in the india-rubber for the purpose of ventilation.

The testes also must be supported in a well-fitting suspensory bandage.

The amount of bodily exercise should be very limited; in the acute stages the patient is better in bed, or on a sofa. For some time after the discharge has ceased the patient must be cautious about the amount of exercise he takes, and avoid hunting, dancing, or other severe bodily exertion. It is also necessary in all cases to warn the patient of the risk of purulent ophthalmia, as many of the uneducated classes are not aware that such contagion may take place.

At first, while the inflammation is slight, and the discharge not great, the patient should rest as much as possible, and follow a spare diet of fish or a little meat, eggs, light pudding, and milk, and give up every kind of stimulant. He may drink barley water, linseed tea, flavoured with lemon peel, or some other bland fluid each day between meals. An alkali, such as a powder containing bicarbonate of soda, sugar, and some flavouring ingredient (F. 72), should also be prescribed.

In cases where the irritation is unimportant, it is not necessary to do more than what has just been directed, and if the urethritis subside in this stage so much the better.

In the *acute* or highly inflammatory stage, depletory measures must be added to the regimen fit for the preliminary stage. The patient, if not taking alkali already, should take every four or six hours a draught containing salines and diaphoretics (F. 46). This will render the urine less acid, consequently less irritating to the inflamed mucous surface over which it passes, and promote perspiration. The bowels must be cleared every morning, or every other morning, with a draught of sulphate and carbonate of magnesia, or a dose of one of the saline aperient waters, such as Hunjadi Janos or Friedrichshalle.

Warm baths, in which the whole of the body is immersed, are very useful; the temperature should be about 95° F., and the patient must remain half an hour at a time in them. Some French surgeons recommend that they should be taken three times a day for four or five days during the violence of the congestion, and then less frequently until the acute stage is passed. Hot hip baths are not so good as warm general baths, as they favour congestion of the genitals instead of checking it. The penis may be wrapped in strips of rag dipped in warm water, and covered with oil-silk; but ice-cold water sometimes gives greater relief, and whichever eases most should be used. When cold is preferred, it should be continuous, so that the rags are not alternately warm and cold, as

frequent change of temperature stimulates injurious afflux of blood to the inflamed parts. Consequently, Otis's coil with cold water current is a very effective method of maintaining a constant low temperature. Pain, if very severe, is also much relieved by fifteen to twenty leeches to the perinæum, with warm fomentations after the leeches have fallen. If the relief following the leeches is not permanent, they may be repeated the next day.

During the acute stage injections of various kinds have also been recommended. We have never found that any, with two exceptions, are of service if the congestion is really violent. Oil, solution of opium, mucilage, &c., appear to harass the patient and increase his discomfort, instead of allaying it. Half-hourly injections of tepid water into the urethra sometimes give great relief, and shorten the acute stage; but very often the patient finds no benefit, and soon loses faith in the remedy. If the congestion be moderate, and the irritation not severe, hourly injections of alum or sulphate of zinc, one quarter of a grain to the ounce, combined with extract of belladonna, are often extremely beneficial, but if the irritation increases they should be at once discontinued. It is very doubtful, also, whether specifics are ever beneficial at this stage. Ricord is strongly against their use, on account of their irritating both the stomach and the urethra. Fournier says he has found very small doses of copaiba (2 minims) allay the pain in micturition, when that is very severe, but he discontinues them as soon as the pain is relieved.

Painful micturition is best relieved by alkaline drinks, to dilute and render the urine alkaline; by warm baths, rest, and local depletion. The injection of ice-cold water into the urethra before micturating, or the immersion of the penis in a cup of ice-cold water during the act, is often very effectual in easing the pain, and Fournier's mode of using copaiba for this purpose may be tried.

Chordee may be often prevented by avoiding all sexual excitement, by moderate diet, and by lying on a hard mattress lightly clothed. Stimulating medicines, or drastic purgatives, increase the tendency to erection, the latter by irritating the pudic nerves. Numbers of drugs have been recommended to ward off or allay the pain, but many of them have very little effect. Camphor is sometimes useful while the acute congestion lasts: two or three grains should be taken in the form of pills or emulsion. Opium is a much more certain remedy; ten grains of Dover's powder may be taken an hour before going to sleep. A pill containing opium, belladonna, and camphor, is often very efficacious (F. 70). A suppository containing $\frac{1}{8}$ or $\frac{1}{4}$ grain of morphia and ten grains of cocoa butter, to which a grain of extract of belladonna may often be added with advantage, also

acts very well. The suppository should be passed into the rectum on going to bed. When the pain is violent, thirty to forty drops of laudanum in a wineglassful of mucilage of starch may be injected into the rectum, as it acts more speedily than the former methods. Among a host of other drugs that have been recommended in chordee may be mentioned chloral, bromide of potassium, Indian hemp, lupulin, and extract of lettuce. Chloral in thirty-grain doses has often succeeded well in our hands. If bromide be given, the dose must be at least forty or sixty grains. If it be found to succeed, it is one of the least disagreeable forms of remedy, as it does not give rise to the unpleasant effects and constipation which attend the use of opium. Lupulin in half-drachm doses mixed with an equal quantity of sugar is recommended by Diday.[1]

When the erection has come on, the application of cold most speedily reduces it. Micturition also shortens the attack; indeed, in slight cases, the mere voiding of urine often suffices without other means. Cold may be applied in various ways: a piece of cold metal may be pressed against the penis or in the perinæum, or cold water may be used. In very obstinate cases, Diday advises that a small pad of cotton soaked in chloroform should be applied to the most painful spot for five minutes.

When the irritation attending urethritis has been allayed by the foregoing means, there is not much more to be done until the inflammation begins to subside, or passes into the chronic condition. In a few more days the discharge changes from greenish to yellow, and grows less; the scalding and erections cease or diminish, and if the patient does not expose himself to fresh irritation, in a week or two more of this expectant treatment all symptoms of his urethritis vanish.

If from any cause the natural termination is not reached, as too often it is not, the discharge must be arrested by repressive agents, *i.e.*, medicines of specific virtues, and astringent injections.

Specific Remedies.—There are several drugs which check discharges from the urethra when administered internally. Copaiba, cubebs, and oil of sandal wood are the most undoubted of them, but the balms of tolu and peru, turpentine, Canada balsam, tar, pine tops, matico, and other allied substances also arrest urethral discharges to some extent.

Copaiba is a diuretic and stimulates the kidneys, and all the mucous membranes. Its effect is sometimes more marked upon the stomach and intestines than on the genito-urinary passages; if so, it causes nausea, indigestion, and even purgation; but when the

[1] Diday: Thérapeutique des Mal. Vén., p. 18.

urethral discharge is greatly diminished by the medicine, the patient is willing to submit to a certain amount of discomfort for the sake of the benefit he derives from its curative effect on the urethra. When absorbed by the stomach, copaiba is excreted with the urine, and may be detected by its odour, or separated from that secretion by ether. It is unsafe to give copaiba where there is persistent pain in the loins or albuminuria, lest it cause hæmaturia. Bumstead[1] relates an instance of this, and a case has occurred under our own observation, where the urine became of a coffee colour on the second day of taking a copaiba mixture.

Copaiba appears to be beneficial in gonorrhœa only when brought in contact with the diseased mucous membrane after its elimination by the kidneys. This is shown by Ricord's well-known experiment: he gave copaiba to a patient with gonorrhœa, who had also a urethral fistula, and directed him, on passing water, to allow all the urine to flow through the fistula. Under this treatment the posterior portion of the urethra quickly recovered, while the portion in front of the fistulous opening continued to discharge. On the urine being allowed to pass through the whole length of the canal, the anterior portion was also soon cured. Hardy and Roquette in experimenting on this subject also found that injections of the urine of patients who were taking copaiba, markedly checked both vaginitis and urethritis, while it is well known that the injection of copaiba in its ordinary condition is almost inert.

From the researches of Gubler it would appear, further, that while the resinous portion of copaiba is chiefly eliminated in the urine, the volatile oil escapes by the skin, and by the respiratory organs. According to this view, the essential part of copaiba in urethritis is the resin.

Erythema Balsamica.—(Copaiba rash; Copaibal Erythema; Erythème résineux; Roséole Copahique). In some persons, copaiba causes febrile reaction and irritation of the skin, over which an erythematous highly irritable rash spreads. The rash is raised, of a deep red colour, and is most pronounced on the dorsal surfaces of the hands and feet. The wrists, knees and elbows also are favourite seats of the eruption, which is often more or less confluent in these situations. From thence it may spread widely; sometimes the whole body from head to foot is completely covered. The temperature may be raised (we have noticed a temperature of 100°·4), and at the onset of the rash the patient may feel ill and depressed. The itching caused by the rash is usually extreme, though in some rare cases itching is almost absent. Scratching often causes the forma-

[1] Bumstead and Taylor: Venereal Diseases. 1879, p. 69.

tion of wheals, and the rash then resembles severe urticaria; the face also sometimes becomes swollen, and the eyes congested and watery. The eruption usually disappears in a few days, even when the remedy is continued; but it is usually advisable to discontinue the drug, and to prescribe a purge and a warm bath, which is all the treatment required.

Copaiba is not the only drug used in gonorrhœa which gives rise to a rash. Cubebs also causes a somewhat similar eruption. In several cases, however, we have noticed that the rash produced by cubebs was more of an orange-red colour, more distinctly papular, each spot being smaller than in the case of the copaiba rash, and showing a decided preference for the trunk of the body rather than for the extremities. Mauriac[1] relates a case in which a peculiar form of eruption was produced by a mixture of copaiba and cubebs. Some of the patches were circular, and consisted of several concentric zones. In this case also there was raised temperature, slight sore throat, and much swelling of the face.

The good effect of copaiba depends almost entirely on its being given when the mucous membrane is ready for it; if given too early, it fails to do good, and sometimes does harm. The urethra is in the most favourable condition for copaiba when the pain on passing water is nearly gone, when painful erections are at an end, when the discharge has become less in quantity, yellow rather than greenish, and viscid rather than purulent. But the persistence of one or other of these signs, if the inflammation is manifestly subsiding, does not always contra-indicate the use of copaiba. *Much* pain in passing water is always a sign that specifics will do harm; so also is a congested bright red or livid red state of the mucous membrane, with copious discharge.

In apportioning the quantity of copaiba to be given, a few points are to be borne in mind. The best effect is produced when the blood is continuously charged with the drug; hence the doses should be frequent, but as copaiba is extremely apt to disorder the stomach, no more should be given than is necessary. Some persons can only bear it in minute doses, others will digest large doses easily, and require them to produce any effect on the discharge. In all cases it is best to give as much as the patient is likely to bear, and moderate the dose afterwards if necessary; but usually from half a drachm to two drachms of copaiba per diem, in divided doses, is as much as he can bear without producing nausea, indigestion, and loss of appetite. The best time for taking it is between meals, before the stomach is empty. The patient should avoid drinking much, that the effect of the copaiba may not be weakened by diluting the urine.

[1] Mauriac: Annales de Derm. et de Syph. Juillet, 1880.

The nauseous taste of copaiba has led to innumerable methods of administering it. It is usually prescribed in an emulsion with liquor potassæ (F. 48) or mucilage of acacia (F. 47) with some flavouring material. Lebert recommends the addition of ten to twenty grains of extract of liquorice to each dose, by which the taste of the copaiba is disguised to some extent. When, however, the liquid form is intolerable, copaiba can sometimes be taken if rubbed up with cubebs into solid boluses which may be coated with magnesia. When none of these preparations are possible, the capsules[1] should be given at the rate of 6 to 20 per diem. The gelatine capsules are better than those of membrane, because the latter sometimes pass through the intestines undissolved.

Cubebs is secreted in the urine in the same manner as is copaiba, but is less nauseous. The bulk of the necessary doses of the powder (which must always be freshly ground) however renders that form somewhat objectionable. It may be given in the common electuary of three parts of cubebs to one of copaiba and one of magnesia. Cubebs may also, for anæmic persons, be usefully combined with carbonate of iron in the proportion of one drachm of cubebs to a scruple of the carbonate. Cubebs may also in some cases be prescribed with powered alum with advantage. Instead of the powder, oil of cubebs may be given in capsules with copaiba and tar, as recommended by Sir Henry Thompson (five to fifteen a day), or the oil may be prescribed in solution with tincture of steel and tincture of belladonna.

Zeissl[2] employs the ethereal extract of cubebs and spirit of turpentine in equal parts, made into a mass with magnesia. This is divided into five-grain pills, of which twenty-four are given during the day. Heidenreich[3] tested the value of the oil of cubebs, of the resin and of crystallised cubebin, by giving each separately in large and frequent doses. He found that the resin alone acted as a diuretic, hence he attributes the curative power of cubebs to the resin only.

The therapeutic effect of cubebs resembles that of copaiba; one drug often suits a patient better than the other, but this must be learned by experiment in each case. Cubebs, however, is less irritating than copaiba, hence it is better borne by dyspeptics.

Oil of yellow sandal wood is very similar to copaiba in its thera-

[1] M. Paquet has recently brought before the Société de Thérapeutique capsules prepared by him from copaiba resin, after separation of the volatile oil. Mauriac, Paul, and others, have found them quite as efficacious as those containing the oleo-resin. Many of the disagreeable effects of the latter, *e.g.*, disagreeable odour of the breath, nausea, and erythema, are also stated not to have occurred when the resin only was employed. (*Bulletins et Mémoires de la Société Thérapeutique*, 15 Juin, 1881.)

[2] Zeissl: Wiener Med. Wochenschrift. 1879, nos. 38, 39, 40.

[3] Heidenreich: Journal de Pharmacie et de Chimie. Sept., 1869.

peutic and toxic effects, but it can be borne by some persons who cannot tolerate the latter. It is said that sandal-wood oil may produce the balsamic roseola; we have never seen an instance of this kind, but purging and nephritic congestion are not infrequently excited by it. The drug was brought into notice by Dr. T. B. Henderson[1] and may be prescribed according to his formula (F. 50); the amount of spirit contained in it is however objectionable, and an emulsion with mucilage will often be more suitable (F. 49). If neither of these mixtures can be borne the capsules should be given, beginning with from three to five daily and gradually increasing the dose to twelve or fifteen if necessary, unless lumbar pain be complained of, in which case the dose must be at once reduced or the drug discontinued altogether. Hewlett's solution of oil of sandal-wood, cubebs and buchu is also a convenient form and is sometimes beneficial in chronic discharges.

Gurjun Balsam is another drug that was also introduced for the treatment of gonorrhœa by Dr. Henderson. Its use has been revived of late years, especially by the French surgeons. Vidal[2] has had good success with it in half-drachm doses twice a day (F. 51). It is cheaper than copaiba and is said to be less likely to upset the stomach and to be less perceptible in the breath. According to Vidal it may be given at any period of the disease; pain is said to disappear in 48 hours, and cure to take place in from eight to twenty days. Mauriac gives a larger dose of the balsam. We have tried this drug in a few cases in twenty minim doses thrice daily, and think it worthy of a more extensive trial than it has yet received; especially in hospitals, where its low price would be an object.

Balsam of Peru, and *Chian turpentine* are sometimes borne when copaiba or other specifics disagree. Either drug may be given in doses of fifteen or twenty grains in the form of emulsion. *Creasote* in one or two-drop doses has also been recommended.

Oil of Erigeron (Canada Fleabane) has been used by some American surgeons with varying success. It is recommended by Drs. Starke[3] and Prettyman[4] among others. Bumstead states that he has tried it, but without favourable result.

Kava-Kava, the native name given to the root of *Piper methysticum*, is used in the islands of the Pacific as a remedy for gonorrhœa.[5] In this country it does not seem to have been successful. Zeissl states that he has found it of no value. We have never prescribed it.

[1] T. B. Henderson: Med. Times and Gazette. 1865, vol. i., p. 571.
[2] Journal de Thérapeutique. Dec. 25, 1879, p. 944.
[3] Starke: Canada Med. and Surg. Journal. See also Practitioner, vol. xvii., p. 63.
[4] Prettyman: Am. Jour. Med. Sci. July, 1866.
[5] Bulletin Gén. de Thérapeutique. Janvier, 1860. See also New York Med. Record. May, 1876.

The root of the *Gelsemium* or *Gelseminum sempervirens* (yellow jasmine) has been recommended by certain writers for the treatment of gonorrhœa. Douglas[1] of Chester, U.S., has reported a case treated successfully by this drug, but we have ourselves no experience of its use in gonorrhœa. Fournier[2] speaks of the *oil of rosemary* as having specific value in checking gonorrhœa, but he is not prepared to say how far it may be relied on for this purpose.

Zeissl[3] tried the effect of *inhalation of spirit of turpentine* in two cases of copious urethral discharge in gonorrhœa. No inconvenience resulted and no sensible diminution of the discharge for thirteen days, but it had quite disappeared in 23 days. The patient was kept in hospital all the time and inhaled for a quarter of an hour twice daily.

When specifics are resorted to, they should be continued for some time, even when, as often happens, they check the discharge at once, for it should never be forgotten that the condition producing the discharge is always much slower to subside than the discharge itself; hence, if found to act favourably, they must be steadily continued for three or four weeks. While they are being taken, beer, wine, and spirits must be withheld, or their good influence will be much impaired.

Injections are by some surgeons almost exclusively employed in the treatment of gonorrhœa, and at every stage of the disorder; while by others they are condemned as useless or even hurtful. Moreover a large number of substances are used for this purpose, many being very different in quality and effect. With the scanty knowledge of their physiological effect we possess, it is natural that when prescribed hap-hazard, without regard to the patient's condition, injections should sometimes cure, sometimes have no influence, and sometimes do harm. Nevertheless, when proper precautions are adopted, there is no reason to fear violent inflammation of the deeper part of the urethra, extending to the prostate or the neck of the bladder—accidents that sometimes follow a mistimed use of astringents. Affections of the joints and other parts, and strictures of the canal, are often popularly attributed to using injections, but there is no foundation for this in reality. Arthritic complications are more frequent when no injection has been employed than after using one. Strictures are caused by long-continued inflammation of a part of the canal, and if the injection is rightly used, it will be more likely to prevent a stricture by curing the chronic inflammation than to induce one. The value of injections is most generally acknowledged for

[1] Douglas : Med. Times and Gazette. 1857, vol. ii., p. 569.
[2] Fournier : Nouveau Dict. de Med. &c., tom. V. p. 174.
[3] Allgemeine Wiener Med. Zeit., no. 16, 22 April, 1873.

checking the discharge after acute inflammation has ceased; for too early use of them is often the cause of mischances that sometimes follow their adoption. Recourse should rarely be had to them until the acute inflammation has nearly subsided, and they are most effective when given to complete a cure that has already made progress by other means.

Several conditions must be fulfilled to render injections efficacious. They must be continued for a considerable time, not laid aside as soon as the discharge disappears. An injection should always be weak at first, never sufficient to excite more than a few minutes' smarting, the strength being gradually increased until the desired effect is produced. The strength should then be gradually diminished, until it reaches that used at the commencement. Injections must also be used often enough; usually three times daily is sufficient, and the fluid should be retained one and a half or two minutes before it is allowed to escape. Another indispensable rule in using injections is to give them up whenever they irritate the canal, or to change them until one is found that the urethra can bear. The susceptibility of the urethra to injections varies much in different persons. Reaction sometimes occurs after their first application; in such cases a few days' pause and a weaker solution will enable the patient to begin his astringent treatment again. In some the mucous membrane is stimulated by very weak solutions; in others it requires a solution four times as strong to check the discharge, and restore the urethra to a healthy condition.

Besides prescribing an injection, the patient should always be instructed in the method of using it; if untaught he often derives little benefit from its use. The syringe should be made of glass, and should be short and wide, that one hand may work it easily. The nozzle should be short, and bulbous at the extremity, that the meatus may be readily closed against it. When the injection is to be used, the patient makes water to clear out the discharge that has collected in the passage. This precaution taken, he inserts the nozzle into the canal, and pinches the penis with the thumb and fore-finger of the left hand *on each side* of the nozzle, *not above and below*, to avoid compressing the fossa navicularis and thus preventing the injection from reaching the part where it is often most wanted. All being ready, he depresses the piston with the right thumb until the injection is thrown in. Unless the discharge come from the prostatic part, it is not necessary to inject more than about two tea-spoonfuls at a time, but that quantity should be retained for about two minutes before it is allowed to escape; if it has properly distended the passage, the fluid will return with a spirt from the meatus.

The drugs employed in injections are of various kinds; some

suitable to one condition, some to another. If the discharge is thick and tolerably plentiful, but scarcely any scalding remains, an injection of zinc and belladonna (F. 6) may be employed, or a weak solution of nitrate of silver (F. 8) is useful when the discharge is white and moderately copious. Where these fail of effect, but do not excite pain and irritation (in which case injections must be postponed), they should be changed for some other astringent. The chloride of zinc (F. 7), or the acetate of lead (F. 9) or of zinc (F. 10) should be used, beginning with a weak solution.

A useful formula in some cases, if the foregoing fail, is one containing the four sulphates—alum, zinc, iron, and copper (F. 13). If severe smarting follow the use of any injection, it must be diluted before it is used again, and the strength gradually increased till the full strength is used or the discharge stops. This being attained, the strength should be diminished step by step, until plain water is reached. Ten days should thus be employed, and a pause allowed before any other treatment is adopted, should that prove necessary.

Various other drugs, such as oxide of zinc and calamine suspended in mucilage and water, have been employed, but their use does not give better results than those obtained by the before-mentioned preparations. A useful injection for a serous discharge from a relaxed mucous membrane is one containing bismuth (F. 14); it should be employed three times daily, for three or four days, and then gradually discontinued. Rough red wine, such as Burgundy, used as injection, is sometimes successful where other means have failed. It should be diluted with once or twice its bulk of water. Glycerine of tannin, diluted with four times its bulk of water, is very effective when the discharge depends on a general relaxed condition of the mucous membrane. It must be remembered, however, that tannin leaves an indelible stain on the linen. Alum also is useful in similar cases (F. 11). Solutions of rhatany, and other vegetable astringents are sometimes beneficial, but they are uncertain in action. Keyes[1] recommends ordinary tea as an injection in thin chronic discharges. A solution of quinine or of perchloride of iron (F. 12) is also sometimes effective.

The permanganates of potash and of zinc have been praised by some surgeons. The former, in our hands, in many cases appeared to aggravate the discharge; the latter appeared to do neither good nor harm. Our experience of the zinc salt, however, has only been limited. *Chloral* is stated to have been used as an injection with benefit; Pirovano[2] had success with a one per cent. solution

[1] Keyes: The Venereal Diseases. 1880, p. 268.

[2] Pirovano: Giorn. Ital. d. Mal. Ven. e d. Pelle. Aug., 1874; and Archives of Dermatology. Vol. i., p. 178.

in water. Lecchini[1] used a solution of the same strength in ten cases of acute urethritis. In nearly all, pain and erections were subdued in a few days, and some were cured. In the remainder other means were necessary to quell the discharge. *Silicate of soda* has been used with success by Marc Sée[2] as an injection in acute and chronic gonorrhœa; the strength of the solution was varied from one to three per cent. of the salt in distilled water, according to the acuteness of the discharge. Bougies of silicate of potash and caustic potash were used by M. Bonnafont[3] in four cases of gleet. The injection of a mixture of *Kaolin* or clay earth and water or oil, has been tried with success by some surgeons[4] for the cure of gonorrhœa: we have no experience of this method of treatment. *Hydrastin* has been used in the form of injection, chiefly by American surgeons, and is said to have a favourable effect in some cases.

Irrigation of the urethra is praised by some surgeons, and is said to be beneficial at all stages of urethritis. Durham[5] has written strongly in favour of it, and has invented an ingenious apparatus for carrying it out. A slender vulcanite tube, from 3 to 3½ inches long, ends in a bulb of varying size, the point where the stem and the bulb join being perforated with holes, so arranged that the injection is directed outwards. The bulb is to be inserted beyond the inflamed part of the urethra, and water or some astringent solution is then pumped through by means of a small Higginson's syringe. Harrison[6] has also recently advocated the irrigation plan of treatment in chronic discharges; he uses a flexible india-rubber catheter 6 inches long, to which a Higginson's syringe is attached. According to our experience irrigation cannot be borne in acute urethritis, and in the chronic stage is of very little value.

Treatment of Gleet.—Before attempting to treat a chronic discharge from the urethra, every effort should be made to ascertain the cause. The site of the discharge varies much; the matter may come from the fossa navicularis, from the bulbous part, or from the prostatic part, for these localities may secrete a considerable quantity of discharge when the urethra is not inflamed over a very extensive surface. When the discharge has subsided to a thin gleet, there are

[1] Lecchini: Revista Clinica di Bologna. 1874, no. 11; and Centralblatt f. Chirurgie. 1875, no. 2.

[2] Marc Sée: Annales de Derm. et de Syph. 1872–73, p. 211.

[3] Bonnafont: Union Médicale. 1873.

[4] Hewson: Pennsylvania Hospital Reports. 1869, vol. ii.; Godon: American Journal of Syphilography and Dermatology. 1874, p. 237. Chiene: Med. Times and Gazette. 1876, vol. i., p. 686; and Will: Edinburgh Medical Journal. April, 1879, p. 889.

[5] Durham: Guy's Hospital Reports. 1870, p. 470.

[6] Reginald Harrison: Lancet. 1880, vol. i., p. 760; see also Vajda: Wiener Med. Presse. 1880, nos. 39, 41, 42.

many sources from which it may spring: a small abscess in the wall of the urethra, an enlarged follicle, a wart, or the prostatic sinuses may continually secrete small quantities of matter. An inflamed or granular patch of the urethra is a still more frequent cause. In long-standing gleets a stricture is often the cause of the discharge. Again, many obstinate discharges depend more on the anæmic condition of the patient than on the state of his urethra; or instead of feeble, he may be plethoric and gouty in his constitution. All these various conditions must be sought for before special treatment is adopted. The sources of irritation must be removed; and debility treated by iron, cod-liver oil, and quinine. Good diet, change of air, sea or freshwater bathing are also often requisite to invigorate the patient's system. Gouty persons must have their disposition corrected by colchicum, alkalies, moderate unstimulating diet, and other means of like kind.

When the cause of the discharge is confined to the urethra, that passage should be searched carefully, all tender points and irregularities along the corpus spongiosum noted, and its interior examined by a flexible bougie with a bullet-shaped end; for stricture is far more readily detected by such an instrument than by an ordinary sound. The exploration of the urethra with the endoscope should not be omitted in obstinate cases of gleet. This instrument is especially useful when a small ulcer or wart is the cause of the discharge. When the lesion is found to be of this kind, a drop of caustic solution can be introduced with a sponge along the urethral tube to the exact spot where the discharge is secreted, and a cure is sometimes thus very quickly produced. Desormeaux, who claims great superiority for the endoscope in treating gleets, advises that it should be frequently passed, and an astringent applied regularly to the diseased part. But it will generally be found that after the first few times, the irritation following the use of the instrument excites more discharge than the original lesion. The endoscope is useful to ascertain the condition of the canal, and also to apply caustic once or twice to a wart or ulcer, but it does not supersede ordinary injections.

When the discharge depends on an inflamed or granular patch limited to the bulbous or deeper parts of the urethra, the injections should be applied directly to the tender spot by means of Guyon's or Dick's tube and a small syringe. The bulbous end of the tube marks the diseased spot, and a few drops of a solution of nitrate of silver (10–20 grains to the ounce) are then injected through it. The fluid should be allowed to escape at once.

This active treatment sometimes excites smart inflammation, and perinæal abscess may follow; but when the precaution is taken of

keeping the patient quiet in bed for a few days, this hardly ever happens. The following plan of Diday's ensures that the posterior part of the canal shall be thoroughly bathed by the injection. A catheter, to which an elastic bottle fitted with a stop-cock and nozzle, can be applied, is passed into the bladder. The urine is drawn off, and then six ounces of solution of sulphate of zinc, of two-thirds of a grain to the ounce, are injected slowly; the catheter is now withdrawn, and the patient told to void the contents of the bladder in a natural manner; by this means the urethra is distended during some seconds by the injection passing through it, and every part of the mucous membrane is reached by the fluid. The operation should be repeated daily, unless—as too frequently happens—it cause irritation at the neck of the bladder, which is the chief objection to adopting this method. It is sometimes successful in obstinate cases of discharge from the prostatic part of the canal, and may be tried when other means have been exhausted.

Insufflation.—A catheter with large holes is filled with some astringent powder, and passed to the site of the discharge. The powder is then blown through the holes on to the mucous surface by means of an air syringe fitting the outer end of the catheter. Ricord[1] has used with success in obstinate gleet the insufflation of bismuth and phosphate of magnesia, by means of a straight catheter open at both ends, in which slides another tube formed at one end into a spoon-like trough, the other end screws on to a small caoutchouc ball. The catheter is introduced to the neck of the bladder, and the powder put in the trough, which is passed along the catheter till it projects beyond it in the urethra. The whole instrument is then slowly withdrawn while the ball is compressed, and the air it contains blows the powder out of the trough in a cloud that reaches throughout the lining of the urethra. Wilders[2] also advocates the insufflation of powders, preferably alum and tannin diluted. *Ergotine* has also been applied to the urethra in cases of gleet. Eldridge[3] of Yokohama reports two cases in which he applied Bonjean's ergotine to granular patches of the urethra with good result.

The regular introduction of *bougies* is a very efficacious plan of curing certain obstinate gleets. Discharges from slight stricture, and from induration of the mucous membrane, are most successfully treated by this plan. A bougie, or sound, large enough to fill the canal, should be passed every day or every other day according to circumstances. The bougies usually excite some irritation and

[1] Ricord: Bulletin de l'Académie de Médecine, xxxi. 1866.
[2] Wilders: Lancet. 1873, vol. i., p. 802.
[3] Eldridge: New York Med. Jour. 1879, p. 360.

increase the discharge after the third or fourth time of passing, when they may be left off. After the irritation is at an end, the discharge sometimes ceases completely; but it is generally necessary to have recourse to a mild astringent injection to complete the cure. If the bougies fail to cause reaction, a flexible catheter may be tied in for three or four days. This soon sets up a smart discharge, when the catheter should be removed, and the irritation allayed by demulcent drinks and a few warm baths. If a discharge remains after this, it may be arrested by injections or by a few doses of cubebs and steel.

The irritating power of the simple bougie is increased by covering it with ointment containing calomel, red oxide of mercury, nitrate of silver, or other stimulating preparation. This plan is sometimes beneficial, but it is very uncertain in its effect. Bougies dipped in solutions of gum and nitrate of silver and allowed to dry, are useful to introduce into the bulbous part when an inflamed or thickened patch in that situation is the source of the discharge; the gum dissolves in the mucus of the passage, and sets free the nitrate at the place where it is required. Bougies so prepared are difficult to introduce, because the gum rarely dries evenly, but leaves a rough surface.

Another mode of making direct applications to the deeper urethra is by means of an instrument termed the '*cupped sound;*' it is used chiefly by American surgeons. The sound is an ordinary steel one, with the addition of three cups or hollows on each side near the curve. Any astringent paste—glycerine and tannin for example—that may be selected is placed in the cups, and the sound passed down the urethra until the cups are opposite the diseased portion. The sound may be retained for a few minutes at a time every two or three days according to the effect produced.

Soluble bougies of various kinds are also employed as a means of introducing medicaments into the urethra. Cocoa butter was suggested many years ago by Sir Henry Thompson[1] as the basis for the bougie, with which nitrate of silver or other suitable drug was incorporated. The soluble bougies mostly employed at the present day are those known as Reynal's medicated bougies (Porte-rémède, Reynal) consisting of gelatine with an outer coating of gum in which the active ingredient is dissolved. There are ten varieties of these bougies which contain various sedatives and astringents, separately or combined. The bougies are about seven inches in length and of the diameter of a No. 4 or 5 English catheter; they are used by some surgeons at all stages of urethritis. Lorey[2] states that those containing opium or belladonna have been extensively tried at the Midi Hospital of Paris, and have been successful in relieving

[1] Thompson: Lancet. May 12, 1866.
[2] Lorey: Annales de Derm. et de Syph. 1872-73, vol. iv. No. 1.

painful micturition and in preventing erections. In our hands the use of the bougies during the acute stage has always given rise to more or less irritation and smarting, and we have discontinued using them at this time.

In the later stages, however, and especially in gleet, when the discharge comes from a tender patch, we have used the bougies containing the sulphate or chloride of zinc with opium or belladonna with decided benefit in many cases. The bougie is introduced into the urethra at bedtime (having been previously dipped in water for about two seconds), and allowed to dissolve during the night. The meatus must be closed by a strip of plaster, or a piece of oil silk or a capote may be worn to prevent staining of the linen or bedclothes. Once a day is generally as often as the application can be borne. Injections or any other means that may seem appropriate may be employed during the day. The bougies sometimes cause irritation at the neck of the bladder; and in two cases we have seen swelled testicle follow their use.

Another form of soluble bougie has been lately advertised in connection with the name of Dr. C. L. Mitchell of Philadelphia. These bougies are smoother and more supple than the French variety, and the active ingredient is incorporated with the gelatine, not merely dissolved in the outer coating of gum as in Reynal's porte rémède. We have not yet made a sufficiently extensive trial of them to be able to speak decidedly as to their efficacy.

Bougies containing iodoform have also been used for the treatment of urethritis in its various stages, but, in our experience, without benefit. W. W. Cheyne,[1] who considers gonorrhœa to be of parasitic origin, has lately recommended a combination of iodoform with eucalyptus oil and cocoa butter in a soluble bougie for acute urethritis; he states that he has carried out this plan of treatment with success in about forty cases.

Winternitz[2] of Vienna has designed a method of applying continuous cold to the urethra by means of a double current catheter without an eye. Water of any desired temperature circulates through the instrument for as long a time as may be required. The lowest temperature used by Winternitz is 54½° F. Two obstinate cases of gleet were cured by this means. Keyes[3] has found this instrument of value in some cases of gleet due to a flabby atonic state of the urethra without stricture. He uses water at the temperature of melting ice, letting it run slowly through the catheter for about five minutes at a time.

[1] Cheyne: Brit. Med. Jour. July 24, 1880.
[2] Winternitz: Berliner Klin. Wochenschrift. 1877, Juli 9; also Lond. Med. Record. 1878, p. 22.
[3] Keyes: The Venereal Diseases. 1880, p. 269.

When a gleety discharge is furnished by the little glands and follicles of the urethra it is often difficult to get rid of. If the follicle can be got at readily, a silver wire dipped in melted nitrate of silver may be passed into it; but the application has generally to be repeated two or three times before the discharge stops. The treatment can be readily carried out in the lacuna magna, which is perhaps the commonest situation; but in the deeper parts of the urethra the endoscope will be necessary. If there be much difficulty in getting at the source of a discharge which is solely due to the state of the follicles it is better to leave it alone, as no harm is likely to come of it.

If the patient have hypospadias and the discharge come from follicles just within the meatus, the wire armed with nitrate of silver may be used; and if this fail the follicle may be slit up by means of a canaliculus director and a small knife.

The treatment of prostatic discharges will be considered in the section on Chronic Prostatitis.

CHAPTER IV.

COMPLICATIONS OF URETHRITIS.

Balano-posthitis, Phimosis, Paraphimosis, and **Warts** are all common complications of urethritis, though by no means exclusively dependent on it. They will be described among the Accessory Venereal Disorders.

Retention of Urine.—This troublesome complication of gonorrhœa may make its appearance at any time during the continuance of the discharge. It may occur suddenly or gradually. It sometimes comes on while the inflammation is at its height, from excessive congestion of the urethra closing the canal. But it usually occurs in the later stages of the disease, when subsidence of the inflammation allows the patient to relax his regimen, though the discharge has not wholly ceased; a fit of retention is then brought on by drinking wine, sexual intercourse, or exposure to cold. Inability to micturate may also result from using an injection too soon, or even, though very rarely, from taking copaiba; sometimes, but still more rarely, the protrusion of an abscess or of extravasated blood in the erectile tissue, blocks up the urethra. Retention from these different causes is generally transitory, and easily removed; unless—and this is most commonly the case in retention—the urethra is at the same time permanently contracted by a stricture. Prostatitis also may cause retention.

Treatment.—If the call to pass water be not urgent, thirty drops of laudanum should be given, and the patient placed at once in a warm bath, where he may remain if necessary till faintness come on; for in this condition it often happens that relaxation of the spasm takes place, and the water passes without further trouble. If the congestion is very severe, eight or ten leeches may be applied to the perinæum as soon as the patient leaves the bath, and a saline purge given. When the measures just mentioned do not succeed, and in all cases if the call to pass water be urgent and the bladder so much distended

that it can be plainly felt in the rectum or above the pubes, a catheter should be passed without delay. If no stricture be present, a No. 6 or 7 olivary flexible catheter should be introduced, and steadily, but gently, pushed along the urethra till the bladder is reached; when that is evacuated, the catheter may be withdrawn.

When there is stricture it will be of course impossible to pass a large catheter, and a small one must be employed. Flexible instruments should always be preferred, and can generally be passed, though in certain cases, where false passages exist, a silver one will be required. If the patient is first anæsthetised by chloroform, the catheter will often pass, when if the patient is conscious it is too tightly grasped to slip by. Should the surgeon fail to introduce the catheter, he must not hesitate to puncture the bladder by the rectum or aspirate above the pubes; these resources are however extremely seldom required if due patience and perseverance be exercised with the catheter. When an instrument has been got into the bladder, it should be tied in, lest the difficulty in passing water continue and the bladder fill again, in which case the catheter may not pass a second time. Leaving the catheter in the urethra has been strongly condemned, because its continual presence increases the irritation of the canal; this evil is over-rated, while the recurrence of retention is almost certain to take place if the catheter be withdrawn before the congestion has subsided.

Inflammation of the Lymphatic Glands and Vessels.—During a smart attack of gonorrhœa, the glands of the groin often swell and grow tender for a few days, when the irritation is severe. Rarely the congestion of the glands runs on to abscess, but such a bubo is always a simple one, and heals readily by ordinary means. In weakly or strumous persons, a long-standing discharge may excite the glands to enlarge slowly and painlessly. They seldom suppurate and when abscess does occur it is of the cold variety. The management of bubo in gonorrhœa differs in no respect from that of ordinary sympathetic bubo due to the irritation of venereal sores.

The lymphatic vessels inflame now and then in the course of gonorrhœa. The skin of the penis along the dorsum is marked with a rosy-red streak, and the lymphatic vessels can be felt as hard tender cords on each side the middle line. These signs are soon accompanied by some œdema of the sheath and foreskin, and by pain and swelling of the inguinal glands. In a few days the inflammation subsides, and the skin resumes its ordinary condition. It requires only rest and a few warm fomentations to remove the pain and tenderness. Sometimes the inflammation of the lymphatic ducts is slow, and there is no redness, or other sign of acute inflammation; the cords themselves can

be plainly felt and are usually a little tender along the dorsum, while sometimes even smaller threads can be traced at the sides and in the prepuce when the general œdema is limited. In the course of a few weeks the induration usually subsides and the part resumes its natural condition.

Fournier[1] ascribes another variety of inflammation in the tegument of the penis to inflammation of the lymphatic network. The foreskin grows red, and swells rapidly into a round firm mass. Sometimes this swelling extends to the whole penis, which then reaches an enormous size, and is lumpy and constricted here and there by deep furrows. The pain is very severe, and the constitutional disturbance well marked; micturition is often slow and difficult from the orifice of the prepuce being closed by the swelling. The violent irritation sometimes causes suppuration in the groins, to which the redness and swelling of the skin may also extend. This form of inflammation closely resembles erysipelas in the rapidity with which it extends over the penis, and the amount of œdema it produces; hence, it has received the name of diffused or erysipelatous angeioleucitis. Notwithstanding the seeming gravity of the disorder, it usually subsides in a few days without causing suppuration or any other complication. We have however seen small abscesses form in the loose tissue over the pubes. *The treatment* consists in rest, frequent warm fomentations, and, if the tension be very great, punctures and incisions, without waiting for the appearance of fluctuation. Warm water should also be injected frequently under the foreskin to clear away the discharge.

Hæmorrhage from the urethra to a small amount is not infrequent in gonorrhœa. The discharge is tinged with blood, or a few drops flow from the urethra after an erection or attack of chordee. When the inflammation reaches the neck of the bladder, the passage of a little blood at the end of micturition is a very common symptom. Now and then hæmorrhage is copious, and may be even dangerous if allowed to continue. Fournier[2] mentions the case of a man who rapidly lost a large quantity of blood from rupture of a blood-vessel in the urethra during an attack of chordee. The patient was blanched like a woman after post partum hæmorrhage, and the bed drenched with blood. Such cases are extremely rare, though smart hæmorrhage from rupture of a vessel during chordee is not very uncommon. When called to treat hæmorrhage, nothing need be done for the small loss that accompanies the discharge, or for the few drops that escape after micturition. Even when blood is flowing freely, if the penis is much congested and semi-erect, it need not be checked, unless a con-

[1] Fournier: Nouveau Dict. de Méd. et de Chirurg. pratiques, tom. V. p. 186.
[2] Fournier: loc. cit., p. 180.

siderable quantity has been lost, for the bleeding relieves the congestion, and nearly always stops spontaneously when the penis is relaxed. Should the feebleness of the patient or the amount already lost render it necessary to arrest the flow of blood, this is best done by putting the patient to bed, clothing him lightly, wrapping the penis in ice-cold cloths, and applying ice to the perinæum. Otis's or Leiter's coil is also very useful in such cases. If this do not suffice, ice-cold water may be injected repeatedly into the urethra. Solution of perchloride of iron may be added to the water if the bleeding do not stop. Fournier, in the case just mentioned, used one part of perchloride to five of water before he checked the hæmorrhage. If all these fail, pressure may be applied by passing a catheter and bandaging the penis firmly round it, or, if the bleeding come from the deeper part of the urethra, a well-padded crutch-handle or walking-stick may be pressed firmly into the perinæum.

Inflammation of the Corpus Spongiosum.—The congestion of the spongy tissue may cause extravasation of blood into its substance, which either, by the swelling it occasions, narrows the urethral passage and produces retention, or breaks through the mucous membrane, and gives much relief by emptying the overfilled vessels. Beyond rest and sedatives to prevent chordee no special treatment is needed. Another consequence of inflammation is effusion of plastic matter into the spongy tissue; this causes induration of the penis at such points. While the inflammation is in progress, the penis is swollen and tender in two or three places, which afterwards become harder than the rest of the organ, and occasion deformity when erection takes place. Usually this bend disappears, but sometimes it is permanent, and sexual intercourse may be impossible. More often the deformity receives greater attention from the patient than it deserves, and he becomes morbidly solicitous about the condition of his penis, and full of fancies about his capability for sexual intercourse.

Peri-urethral Abscess.—Abscesses may form about the urethra in several ways.[1] One of the most frequent causes is irritation of the follicles and glands of the sub-mucous tissue. These become distended with matter during the course of gonorrhœa, and form small firm rounded masses beneath the mucous membrane. Those connected with the penile portion remain quiet for a time, then grow tender, enlarge, and in many cases make their way to the surface, instead of perforating the urethra. After the escape of the matter, they may leave small sinuses that close and open from time to time, but are exceedingly slow to heal thoroughly. Now and then larger abscesses than

[1] See a Monograph by Ch. Hardy: Sur les abscès blennorrhagiques. Paris, 1864.

these form near the end of the penis, and slowly make their way outwards or into the urethra. The abscess produces a globular tumour on one side of the frænum the size of a pea, or even as large as a nut; sometimes there is one on each side. Fluctuation is soon well marked, but the abscess may distend the foreskin greatly before it reaches the surface. Evacuation usually occurs by an orifice in the furrow close to the frænum. If the urethra has been opened, a fistula is left between it and the under surface of the penis that is very troublesome to cure.

A favourite locality for the larger abscesses is around the bulb, where they are extremely insidious, and often remain unnoticed by the patient until they begin to extend; they then cause pain at the affected spot, and discomfort on making water. The pain soon becomes constant and throbbing; the stream of urine is often diminished from the projection of the swelling into the urethra, and sometimes retention takes place. If the perinæum be examined in the early stage, a tender, hard, indistinct fulness is perceived; later, the abscess forms a circumscribed tumour placed nearly always a short distance away from the raphé. Fluctuation is generally indistinct until the matter is very close to the surface; but before this takes place the swelling usually attains the size of half an egg, and forms a projection that is easily seen. In some patients there is also grave constitutional disturbance and shivering when suppuration takes place. Commonly the abscess opens externally without communicating with the urethra, in which case it readily heals without further trouble. In other cases, especially when there is organic stricture as well as urethritis, the abscess communicates both with the surface of the body and with the urethra. A *urinary fistula* then forms, or a sinus leading from the urethra, sometimes to the perinæum, sometimes to the rectum. The abscess often burrows widely under the skin in several directions before reaching the surface, and forms a series of tortuous channels, along which the urine escapes whenever the patient makes water.

When the abscess is at the extremity of the penis it usually produces little inconvenience or danger. It may, nevertheless, even here cause great suffering, and sloughing of the corpus spongiosum. In a patient recently under our observation, an abscess formed at the fossa navicularis, and burrowed along the corpus spongiosum for two inches; it then entered the urethra, and the irritation it excited caused sloughing and troublesome penile fistula. The dangerous peri-urethral abscesses are for the most part those in the perinæum, the more so when they open into the urethra, for the risk of extravasation of urine is considerable, though this accident does not always happen. An abscess not infrequently breaks into

the urethra, pus escapes, and continues to pass away for a time in a small quantity; the discharge gradually ceases, and no further mischance results.

Treatment.—In treating abscesses about the urethra, the chief object is to prevent them from penetrating into that canal; hence their progress to the surface should be assisted, and their contents evacuated as soon as possible. A small seton of silk thread may be worn for a week or so to promote closure of the abscess cavity if that lies near to the frænum. When the matter has found its way into the urethra, the patient must be carefully watched, and if there be any difficulty in passing water, a catheter should be tied in the bladder to carry the urine freely away, and lessen the danger of infiltration into the cellular tissue. When this does take place free incisions must be made at once. Should stricture be present, it must be dilated to the full calibre of the urethra without delay.

The Glands of Cowper sometimes inflame during the later (third to fifth) weeks of gonorrhœa, and produce a special though rare variety of peri-urethral abscess. The gland grows painful and swells. At first it can be felt as a small tender knot close to the bulb. The pain is increased by walking, the chafing of the dress, &c. In a few days the cellular tissue around the gland suppurates, (Peri-Cowperitis) and a soft, round, fluctuating tumour points in the perinæum at one or other side of the raphé. Before pointing, however, the pus in this form of abscess is particularly apt to burrow around the urethra and among the muscles of the perinæum. After it has opened, matter drains from the cavity for some time, till the passage closes, and an indurated mass remains. The left gland is more frequently attacked than the right according to Gubler;[1] but both may be simultaneously inflamed. The course of this inflammation is nearly always to the formation of abscess; but it is said that the inflamed gland occasionally subsides without suppuration. During the formation of the abscess, the patient frequently, besides pain and sense of fulness in the perinæum, has pain in the urethra, difficulty in making water, and some constitutional disturbance. *The treatment* consists in rest, warm baths and fomentations, poultices, opiates, saline purges, and an incision as soon as fluctuation can be detected.

Prostatitis.—Inflammation of the prostate, as a consequence of urethritis, may be acute or chronic.

Acute Prostatitis is a rare complication of gonorrhœa. Among 2,041 cases of gonorrhœa admitted into the Antiquaille Hospital of

[1] Gubler: Des Glandes de Mèry (vulgairement glandes de Cowper) et de leurs maladies chez l'homme. Thèse de Paris, 1849. No. 172.

Lyons under the care of Dron,[1] prostatitis occurred only three times. Prostatitis often follows the excitement of sexual intercourse, or alcoholic irritation. It is also likely to happen if a patient with a discharge from the prostatic part of the urethra undertake severe bodily exercise or expose himself to cold and damp. The use of injections immediately after intercourse has also been known to set up prostatitis. Copaiba, cubebs, turpentine, and other drugs taken during gonorrhœa are said to cause prostatitis, but there is no trustworthy affirmative evidence on this point.

Certain authors distinguish inflammation of the follicles from inflammation of the parenchyma of the organ; but in the few post-mortem examinations of acute prostatitis on record, none showed parenchymatous inflammation alone; neither do the clinical signs enable us to distinguish the one form from the other; consequently, this subdivision cannot at present be justified. In all cases probably, unless the morbid process be arrested, parenchymatous soon follows follicular inflammation.

Pathological Anatomy.—In the early stages of acute inflammation, the prostate is enlarged, sometimes, according to Thompson,[2] even to four times its normal size, is charged with blood, and its ducts and follicles are filled with a whitish fluid which exudes from their orifices when the prostate is pressed; when a section is made through it, the position of the follicles is marked by whitish-yellow spots. In these inflamed follicles there is proliferation of epithelium, exudation of blastema, and sometimes secretion of pus. In other cases isolated foci of pus, appearing as little yellow scattered masses, form, and circumscribed abscesses are thus produced. These abscesses sometimes communicate with each other by absorption of the intervening tissue; and in this way large cavities may be formed. These large abscesses either open a way for themselves by absorption into the urethra, or extend beyond the prostate into the cellular tissue of the perinæum, thence passing forward to the surface; or lastly by perforating the wall of the rectum the abscess may discharge itself into that canal. The pus of prostatic abscesses is not creamy or diffluent, like that of an ordinary abscess, but viscid and adherent to the walls of the cavity in which it is produced. Abscess is probably the least frequent termination of prostatitis. Two other terminations are more common. First, resolution without circumscribed abscess; second, induration and permanent enlargement from the production of interstitial fibrous tissue.

Campenon[3] states that the inflammation does not necessarily

[1] Dron: Lyon Médical. 1 Juillet, 1877.
[2] Sir Henry Thompson: Diseases of the Prostate. 3rd edit. 1868, p. 53.
[3] Campenon: Art. Prostate. Nouveau Dict. de Méd. et de Chir. Pratiques. Tom. xxix. 1880, p. 619.

attack the gland throughout its substance, but that it may be limited to isolated portions, one group of glandules being in a state of suppuration, while another group may be almost unaffected. Gross[1] states that the middle lobe of the prostate is less liable to suppurate than other portions of the organ.

While the inflammatory changes are taking place in the prostate itself, the mucous surface of the neck of the bladder, the ejaculatory ducts, and the vesiculæ seminales become congested and swollen. Still more marked is the change in the cellular tissue (periprostatitis) which developes sooner or later during the inflammation of the gland itself, the cellular tissue between the rectum and the base of the bladder being mostly affected.

Symptoms.—The two leading symptoms in acute prostatitis are pain and difficulty in micturition, and pain in defecation. The earliest symptom complained of by the patient is a sense of discomfort and weight in the perinæum, increased by sitting down. This soon increases to throbbing, and is accompanied by a sensation which is compared to that produced by a foreign body in the rectum. There is also painful desire to defecate. An attack of piles also occasionally developes, owing to the free communication of the prostatic and hæmorrhoidal veins. Micturition now becomes slow and more painful than it has been during the course of the urethritis, but it is not greatly increased in frequency. During the prostatic inflammation, the urethral discharge diminishes. As the swelling of the prostate increases, the urine may escape only by drops with much straining, but it is often passed with less difficulty when the patient lies down than when he stands up. Owing to the suffering that attends micturition, retention is often voluntary, the call to pass water being seldom urgent—a marked distinction from the almost constant irritation which accompanies inflammation of the neck of the bladder. The urine in a few days becomes high-coloured, but usually remains free from pus. Bleeding, or spasm at the end of micturition is rare. If, in order to relieve the distended bladder, the catheter be passed, the instrument is often diverted from its course when it reaches the prostatic part of the urethra, and always causes much pain in its passage. If the finger be pressed on the prostate per rectum, great pain is produced. The organ also is felt to be enlarged, and often more so on one side than on the other. Constitutional disturbance is usually absent or very slight, until several days have elapsed. Fever, rigors, mental anxiety, and distress, are, however, occasionally noticed early. Thirst is sometimes a prominent symptom; the appetite is lost, and the tongue becomes dry and marked with a brownish fur.

[1] Gross: Diseases of the Urinary Organs. 3rd edit. 1876, p. 375.

As the inflammation proceeds the pain increases, spreads to the thighs and loins, and is increased by movement. The patient becomes restless and anxious, and can neither sit nor walk without great pain. Verdier[1] speaks of painful priapism as an occasional cause of distress.

After these symptoms have occupied a period varying from a week to a fortnight, the inflammation ends in resolution or in suppuration. If resolution take place, the impediment to micturition diminishes in the course of two or three days and the general disturbance quickly subsides; but the prostate remains enlarged for a long time, and sometimes even permanently. In rare cases the prostatic urethra remains diverted or altered in its position, so that micturition is slow, and retention easily produced. Relapses also are not infrequent from neglect of precautions against irritation or other cause.

Abscess.—Besides the follicular abscesses produced in acute inflammation of the ducts already mentioned, abscess often forms rapidly during the course of acute prostatitis in and around the prostate. When in the organ itself, the abscess usually breaks into the urethra, and gives immediate relief, the urine flows easily, and brings away much pus. When the focus of suppuration is rather outside the prostate than within its interior, the abscess may point in the rectum, or in the perinæum. The advent of suppuration is usually marked by repeated shivering fits, after which the general fever abates, and the throbbing pain in the prostate gets more distinct and constant. Some time elapses before the abscess reaches the urethra or the rectum, during which the patient is still tormented by retention of urine and pain in defæcation; but the moment the matter escapes relief is immediate, and the power of emptying the bladder is soon regained. After the escape of the matter the cavity shrinks, and the patient usually recovers without further trouble, except some irregular enlargement of the prostate.

In certain cases of long standing the urine gets into the abscess, and infiltrates among the cellular tissue round the neck of the bladder. This mischance is signalled by sudden severe rigor, great distress, and pain. Unless relief be speedily obtained, the patient's strength fails, and after a short period of great suffering he dies, exhausted by the suppuration in and around the prostate. Post mortem the prostate is found to be pale, riddled with fistulæ containing putrid matter, and beset with abscesses which often communicate with the bladder and rectum. Peritonitis has occasionally been observed in cases of sloughing and destruction of the

[1] Verdier, quoted by Campenon: loc. cit. p. 620.

prostate through infiltration of urine or fæces into the cavities of the abscess.

The Diagnosis of acute prostatitis is made from the history of recent urethritis, the pain and weight in the perinæum, pain and difficulty in micturition, and especially the swollen and tender condition of the organ as ascertained by examination per rectum. Perinæal abscess and abscess of Cowper's glands are distinguished by the tenderness and swelling being felt in the perinæum, and not in the rectum. Inflammation of the neck of the bladder and cystitis are characterised by the violent spasm which attends the close of micturition, a little muco-pus or blood being ejected with the last drops of urine; by the absence of painful defecation or of retention of urine; and, finally, by the unenlarged indolent condition of the prostate when examined by the finger.

Prognosis.—In most cases the prognosis is good. In a week, or sometimes two weeks, the malady subsides and the patient gradually regains his natural condition, except that the prostate remains more or less enlarged for a long time. In a small proportion of cases abscess forms, and under these circumstances the duration of the affection is prolonged for another week. In very rare instances considerable destruction of the prostate by suppuration and gangrene ensues; in which case the patient may die from pyæmia or from exhaustion.

Treatment.—In the early stages, the bowels must be cleared by a smart purge, and then kept relaxed by saline aperients. The patient must be kept in bed; his diet must be moderate, unstimulating, and limited to articles of food which furnish but a small amount of refuse, such as strong soups or milk. Alcohol in any form, strong coffee, and acid drinks must be avoided. If thirst is pressing it may be assuaged by sucking ice. Robust patients are benefited by the administration of antimony with henbane and bicarbonate or citrate of potash (F. 46.) every four or six hours, during the early and painful stages of the affection. If there be much prostration, quinine in four or five-grain doses should be administered three or four times in the twenty-four hours. In such cases also, brandy, ammonia, and strong nutritious soups are needful, though only in cases of prostration should any form of alcohol be allowed. Acute or severe pain must be relieved by belladonna and opium suppositories, or by morphia subcutaneously injected or given by the mouth. Chloral also is often a useful hypnotic in these cases.

The local treatment comprises the hot bath, leeches to the perinæum, and the evacuation of pus as soon as its presence can be ascertained beyond doubt.

The hot hip bath (102°, raised to 108° F. in a few minutes) in which the patient sits for eight or ten minutes is of great value. This bath, which draws the blood away from the pelvic viscera to the skin, may be repeated twice daily while the pain is severe. In the intervals hot fomentations should be applied, and extract of belladonna mixed with an equal weight of glycerine may also be spread freely over the perinæum and buttocks. Leeches are of great service at the outset. The best place to apply them is the perinæum, close to the anus. They should be employed freely, ten or twelve at once, and the bites encouraged to bleed by a warm linseed poultice applied after the leeches fall off. It is seldom useful to repeat the leeching, though in rare cases it may be beneficial to do so. Should a cupper be at hand, eight or ten ounces of blood may be more speedily abstracted by the cupping glasses than by leeches. Venesection is rarely if ever called for. If micturition become so painful and difficult that the urine is voided only by drops, and still more if complete retention occur, a catheter must be passed three or four times in the twenty-four hours. The instrument should never be tied in, but withdrawn as soon as the bladder has been emptied. In all cases the most extreme gentleness must be exercised, both on account of the pain the catheter causes, and also on account of the ease with which serious and even fatal injury may be caused to the tumid and friable organ. In nearly all cases a very supple olivary French catheter about the size of No. 7 of the English scale should be used. Should this fail to reach the bladder, a coudé or bicoudé instrument should be tried. When these also fail to pass, an English flexible catheter which has been kept on a stylet of which the last two inches have been bent into three fourths of a circle may succeed. On withdrawing the wire the catheter retains the curve sufficiently to enable it to slip through the prostatic urethra in its distorted condition. It is very rarely necessary to have recourse to a metal instrument, though occasionally the bladder can only be reached by a silver catheter with a long curve. If the swelling be so great as to close the passage altogether to a catheter, aspiration of the bladder above the pubes must be employed. This was done in a case under the care of Dron[1] without any ill result.

If abscess form, the question of opening it may arise. Operative interference, however, is seldom required, because the matter most frequently extends towards the urethra and the question of evacuation is commonly solved by the abscess bursting into that canal, whence the pus quickly escapes. When the occurrence of rigors, the persistence of painful micturition and other symptoms suggest

[1] Dron : loc. cit.

the occurrence of acute abscess, while a soft doughy or apparently fluctuating swelling of the prostate in the rectum indicate pointing in that situation, great caution must be exercised before employing the knife. The whole prostate often becomes soft and distended without any special circumscribed collection of pus having formed, and this condition may be mistaken for abscess. True abscess when pointing in the rectum forms an isolated projection, much softer and more plainly fluctuating than the rest of the prostate; and in all cases this condition should be present, before a puncture is made. The abscess may be most conveniently opened by a short bistoury passed along the finger as a guide to the projecting abscess in the rectum.

Occasionally prolongation of the patient's sufferings and circumscribed deep-seated perinæal fluctuation show that the abscess, instead of breaking into the urethra, or pointing in the rectum, has burrowed between the layers of the perinæal fascia. In such cases it may be necessary to incise deeply through the perinæum for one and a half or even two inches to give exit to the pus. To do this, the surgeon, being well satisfied of the presence of matter, should place the patient in the position for lithotomy, and cautiously divide the tissues in the median line between the scrotum and the anus, feeling with his left fore-finger in the wound for the abscess until he approaches sufficiently near it to be able to define its position precisely; the bistoury may then be thrust into it without further hesitation.

Chronic prostatitis is a not uncommon sequel of gonorrhœal urethritis; it may form the termination of an acute attack of inflammation of the prostate, or come on gradually and often almost imperceptibly when urethritis has existed for some weeks. Campenon[1] states that the chronic form frequently precedes the acute; but this does not accord with our experience.

The immediate cause of chronic prostatitis in gonorrhœa is extension of urethritis to the prostatic portion of the urethra. Ancillary exciting causes are those which cause congestion of the organ: for example, the venereal orgasm and especially the practice of onanism, exposure to cold or damp, alcoholic excess, violent exercise or prolonged fatigue, such as dancing, riding, or long railway journeys. Again, the gouty and rheumatic diatheses and the lymphatic temperament are predisposing causes of chronic prostatitis.

Pathological Anatomy.—In those cases where the inflammation is the sequel of acute prostatitis, the organ is enlarged more or less; often firmer than natural from congestion, and probably also from

[1] Campenon: loc. cit., p. 606.

increase of the fibrous stroma. The mucous membrane of the urethra is dull red, or slaty grey in cases of long standing, and to its surface are attached shreds of viscid, inspissated muco-pus, which also can be squeezed from the dilated orifices of the ducts of the organ. In cases where the inflammation has not lasted long, when the gland is cut into, the tissue is seen to be firmer and redder than natural, and perhaps one or two follicles are distended by viscid, reddish pus. When chronic inflammation has lasted for months or years, the volume of the prostate is often preternaturally small, its substance dense, and sometimes even puckered by contractions which have followed abscesses. In such long-standing cases also, an abscess of the size of a bean or a marble may be found in the substance of the organ, or in the periprostatic cellular tissue. But these conditions, though actually met with, are decidedly rare. Probably in the great majority of cases of gonorrhœal chronic prostatitis, the morbid changes are limited to catarrhal inflammation of the prostatic urethra and of the ducts which open there, with some amount of congestion of the prostate itself.

The symptoms of chronic prostatitis are extremely complex, and need careful examination in order to reach a correct diagnosis. There is a history of a previous or attendant gonorrhœal urethritis, the symptoms of which not infrequently complicate or mask those of the prostatic affection. The patient usually complains in the first place of uneasiness in the vicinity of the anus, sometimes described as heat, sometimes as weight. This sensation is aggravated by sitting long at a time or by long walks, often by riding and driving. When thus temporarily increased, the pain often spreads to the sacrum, loins and thighs. The local pains are accompanied by a sense of weariness, and lowness of spirits amounting in many cases to complete hypochondria. The digestion is disturbed, the tongue furred, and the appetite sometimes lessened; the bowels are irregular, and usually more or less constipated. The act of defecation not infrequently causes a hot painful sensation during the passage of the fæces. The calls to micturate are increased in frequency, but not greatly so, except in very nervous persons; and even in them, if their attention be diverted by the calls of business or by amusement, the bladder can retain its contents for four or five hours without inconvenience. The patients can also pass the night without being roused from sleep to void urine. The act of micturition is usually attended by pain, varying in severity, but generally of a scalding or burning kind, and felt while the urine is flowing and for a short time afterwards. The seat of pain is the prostatic urethra, and is referred by the patient to the neighbourhood of the anus.

The discharge from the urethra has peculiar characters. In most

cases of gonorrhœal prostatitis, the fore part of the urethra still furnishes some muco-pus, which exudes from the meatus pretty continuously, either in sufficient amount to appear as a drop at the orifice, or it dries there and glues together the lips of the meatus between the intervals of micturition. Prostatic discharges behave differently, being retained at the posterior part of the urethra by the deep perinæal muscles, which act as a sphincter; consequently the prostatic discharge is intermittent, being generally washed out as a drop of viscid pus in the first flow of the stream during micturition. This first portion contains the secretions which have collected in the whole urethra, but when the amount is scanty the urethral discharge is mainly shreds of inspissated matter, while that from the prostate is in larger, thicker masses. But much reliance must not be placed on this condition of the discharge. To distinguish a prostatic secretion, the urethra must often be examined by a special method, with a bullet-bougie or sound. This instrument, with a bulb of a size to fit the urethra without stretching it (No. 22 or 24, French scale), should be passed along the canal to the bulbo-membranous part and then withdrawn. By this means the fore part of the urethra is swept of any discharge that may have collected in it, and, of course, valuable information is often gained at the same time respecting the condition of this part of the canal. The bougie is then introduced a second time, but is carried this time as far as the neck of the bladder. When it passes the membranous part there will be a slight resistance both in going in and coming out, caused by the contraction of the deep transverse muscles. As the bullet of the bougie emerges from the membranous part, it brings with it the prostatic muco-pus which had collected in that part of the urethra since the last occasion of voiding urine. Prostatic mucus, if pretty plentiful, can also sometimes be driven into the anterior part of the canal by the pressure of the finger in the rectum. Another peculiar symptom is the sense of heat and pain occasioned by the instrument as it traverses the prostatic urethra. This pain is probably not really very severe; but the nervous excitement of some patients induces them to make violent demonstrations of the agony they fancy they endure. The suffering, however, is very transitory, and in a few minutes has passed away.

Next in importance is the condition of the prostate when felt per rectum. Usually its bulk is not much altered, but it may be considerably enlarged; this is always the case if the chronic inflammation be a consequence of the acute form, but in nearly all cases the organ is more or less tender on examination per rectum.

Treatment.—Chronic prostatitis is most difficult to treat. While the organ is still tender and enlarged the patient must be restricted

from riding, and every violent exercise. His diet should be nourishing, but stimulants must be very cautiously used: claret and light wines being always preferable to port, sherry or brandy. Every precaution against exciting congestion of the prostate must be taken. Sexual intercourse or sexual excitement of any kind should be carefully avoided, and the patient should lie on a mattress at night, with only a moderate quantity of covering. The bowels must be cleared every day to prevent congestion of the rectal and prostatic veins, and the patient must take tonics if he is at all debilitated. Medicines in the later stages have often but little effect on the gleet, but iron, cod-liver oil, quinine, and nux vomica or strychnia, are all useful in invigorating the patient's constitution. A course of tepid sea baths in winter, and bathing in the open sea in summer, are very beneficial. If gouty, the patient must take alkalies or resort to Carlsbad or Harrogate.

When the prostatic tenderness has subsided, cool hip-baths for five minutes morning and evening, beginning at 85° F. and gradually lowering the temperature every third day until 50° F. or even 40° F. is reached, are most beneficial. The baths may be continued daily for several weeks with benefit. If they are really doing good, the patient at once experiences relief, being more free from weakness and aching pain after each bath than he had been before.

Continuous small blisters applied to the perinæum, or a small seton, when blistering has been fairly tried without producing a good effect on the discharge, is recommended by some surgeons; but we have never been able to satisfy ourselves that either of these methods has been of real service. Counter-irritation of a large surface is occasionally useful. A caustic solution of iodine should be painted on the perinæum and neighbouring parts of the thighs over an area as large as half a square foot. Thus an amount of local irritation is produced that prevents the patient from walking for several days. In some cases the effect is excellent, and a rapid improvement is effected, but such success is by no means constant.

When the prostate is not painful on pressure, its relaxed ducts may be stimulated by passing at first a flexible bougie, and afterwards a steel sound, twice a week. The size of the instrument should be gradually increased up to the largest that the meatus will admit.

Some surgeons still cauterise the prostatic urethra for chronic discharges with solid caustic, after the manner of Lallemand. This method has many objections; it often causes violent irritation, pain, and sometimes even perinæal abscess; it is also extremely uncertain, from the difficulty of applying the caustic exactly where it is

wanted. For these reasons this method of treatment must be reserved for cases where all other plans have failed, and its ill-effects should be guarded against by preparing the patient with a few days' rest before the cauterisation, and by keeping him very quiet for some days afterwards. Immediately after the operation he should take a warm bath, and stay in bed till the pain has passed off. A less severe measure than this consists in the injection of a few drops of a solution of nitrate of silver (20 grains to the ounce) through a Guyon's injector. This is sometimes very successful in allaying the irritability due to chronic prostatitis. In patients whose discharge is trifling, but of great obstinacy, and resisting the most careful treatment, time will often work a cure if the urethra be left to itself. Such persons must, however, have their impatience allayed by treatment that occupies their attention, and satisfies them that something is being done for their relief. A long sea voyage is often most beneficial. When all the prominent symptoms have vanished, marriage will be found in most cases the best means of completing the cure.

Inflammation of the Vesiculæ Seminales is a complication very little known and seldom seen. Fournier[1] describes the symptoms as being somewhat similar to those of prostatitis. There is pain in the perinæum, increased by defæcation and often extending to the testes. Erections and emissions at night are frequent. Fournier noted that the semen was streaked with blood. When the finger is passed into the rectum two oblong elastic tumours can be felt, which are painful when touched. The inflammation in Fournier's cases lasted a few days, and then subsided without further mischief.

Inflammation of the Neck of the Bladder.—This is a not infrequent complication of gonorrhœa, when the inflammation has reached the deeper part of the urethra. It is most often excited by using too powerful injections, by a long railway journey, or severe bodily fatigue, or by indulging in alcoholic liquors while the discharge is copious: yet in many cases none of these causes precedes cystitis. The attack comes on sometimes during the second or third week of the gonorrhœa, when it may be simply an extension of the urethritis into the bladder. The urethral discharge greatly lessens during the presence of the vesical inflammation, and the return of the urethritis is a signal that the deeper inflammation is over. Often, however, the cystitis does not occur until the urethritis has almost disappeared; and at a time when the patient is congratulating himself on the termination of his malady.

Inflammation of the neck of the bladder is characterised by three

[1] Fournier: loc. cit., p. 199.

symptoms, which are always more or less urgent. The first is frequent desire to make water. This is sometimes irresistible; the urine must be passed at the moment the desire is felt, and the patient often cannot help voiding it into his dress before he can gain a retiring place. In severe cases the desire to micturate becomes constant, even every minute, for as soon as a drop escapes from the ureter, it excites an uncontrollable desire to emit it. Next, instead of relief following the evacuation, a violent burning pain is felt at the neck of the bladder, which radiates to the loins, groins, thighs, and belly, but is always most intense at the bladder the moment the urine escapes. Thirdly, the urine when the stream begins to flow is clear, but the last drops are always mixed with pus or blood; in many cases one or two drops of pure blood follow each evacuation, even when micturition has lost much of its frequency, and the water can be retained an hour or more at a time. The constitutional disturbance is generally slight; there is little or no fever and no loss of appetite, but the mental anxiety almost equals the bodily suffering, and the patient is especially apt to become irritable and desponding. The dread of further extension is constant and harassing. The urine usually remains acid as long as the affection is limited to the neck of the bladder. The pus is moderate in quantity, and when the urine is allowed to stand for a few hours, the sediment is more or less ropy and adherent to the vessel, but very much less so than in general cystitis. After a few days, unless the disorder is aggravated by the neglect of the patient, it subsides gradually, and in a fortnight matters have resumed the condition they were in before the neck of the bladder was attacked. But longer duration than this occurs sometimes. One of the severest cases we have seen lasted nearly three weeks, in a gentleman who habitually took much bodily exercise and drank his bottle of old port wine every day after dinner. Authors relate cases of much longer duration than this, even one or two months, where the frequent micturition and the spasmodic pain lasted the whole time. But even in the cases of long continuance, the patients recover without ultimate injury from the inflammation which caused them so much suffering. Relapses are however very frequent.

In a large number of patients the symptoms are much less accentuated than in the foregoing description, and consist merely of frequent calls to pass urine, spasm after passing it, and the ejection of a drop of pus, or occasionally of blood, at the close of micturition.

In extremely rare cases the inflammation extends to the whole mucous membrane of the bladder; the symptoms are then the same as in acute general cystitis from other causes.

Diagnosis.—Inflammation of the neck of the bladder is distin-

guished from prostatitis by the large amount of spasm and irritation of the neck, the absence of retention and of rectal tenderness, and finally, the invariable discharge of pus or blood at the end of micturition.

Treatment.—Rest in bed, unstimulating diet, laxatives, alkalies,—citrate or acetate of potash,—and demulcent drinks, such as decoction of triticum repens, barley water, or other similar preparation, should be prescribed. Such means, together with warm baths large enough to receive the whole body, opium and belladonna suppositories, and clysters of laudanum in cold water, generally allay the inflammation in a few days, though a tedious duration of weeks is occasional. Sometimes a few small doses of copaiba will check the irritability in a most rapid manner, though it very often has no effect at all. After the irritation has subsided, the resumption of injections to arrest the urethral discharge that returns when the cystitis is at an end, must be very cautiously adopted, and it is best to be content with copaiba or cubebs.

Pyelitis and Nephritis occasionally occur as an extension of gonorrhœal urethritis. Murchison[1] has recorded two fatal cases, one in a male and the other in a female, where death rapidly followed the occurrence of grave symptoms, consisting of coma and low muttering delirium, ending in death shortly after their onset. Post mortem the whole urinary tract from the meatus urinarius to the substance of the kidney was in a state of acute inflammation, and full of thick yellow pus. We have met with no other record of such cases, but the details furnished by Murchison leave no doubt of their gonorrhœal origin. Both these cases had been sent to the London Fever Hospital as cases of fever.

A case of *perinephritic abscess* in connection with gonorrhœal prostatitis and cystitis is reported by Lafoyne[2] of Toulouse. A free incision was made and the patient recovered.

Pyæmia.—Several cases of fatal pyæmia in connection with gonorrhœa are on record. In one such case reported by Jubist,[3] the patient, a young man aged 23, was under the care of Villeneuve of Marseilles. The post mortem appearances were, inflammation of the corpora cavernosa, the urethral mucous membrane being intact, phlebitis of the prostatic plexus, abscesses in the liver and left lung, and suppuration of the right elbow joint and among the muscles of the right arm. Wilks and Moxon[4] mention two

[1] Murchison: Clinical Trans. 1876, p. 25.
[2] Lafoyne: Rev. Med. de Toulouse. Dec. 1876, quoted by Faucon. Arch. Gén. de Mel. 1877. Tom. ii.
[3] Jubist: Gazette des Hôpitaux. 27 Mai, 1873.
[4] Wilks and Moxon: Pathological Anatomy, pp. 167 and 529.

somewhat similar cases in which also there was no abrasion of the mucous membrane. One of these was under the care of Dr. Habershon in Guy's Hospital. In both there was phlebitis of the prostatic plexus and fatal pyæmia.

Epididymitis and Orchitis.—Inflammation of the epididymis (*swelled testicle*) is probably the most frequent of all the complications of gonorrhœa. Dron[1] noted its occurrence in 726 out of 2,041 cases of gonorrhœal urethritis. One side or both may be affected, and there appears to be little or no difference in the frequency with which the right or left organ is attacked, but double epididymitis is comparatively rare. Of Dron's 726 cases the right side was affected in 337, and the left in 328, while in 61 both epididymes suffered. Jullien[2] has collected 2,160 cases, of which 1,011 were on the right side, and 982 on the left; 165 were double. Of 51 cases noted by ourselves, in 27 the right and in 24 the left epididymis was inflamed.

It is doubtful if inflammation ever begins simultaneously on both sides, but in some instances inflammation of one organ rapidly follows that of the other. Thus we have seen acute inflammation present in both testicles at the same time, so that only two or three days intervened between the onset on the two sides. Similar cases are recorded by various authors.

Epididymitis arises by the extension of inflammation from the prostatic urethra along the mucous membrane of the ejaculatory duct and vas deferens to the epididymis. This explanation has only of late been received as the general mode of origin of epididymitis during urethritis. Formerly several other explanations had their partisans, and indeed have them still. One was that it arose by metastasis, *i.e.*, that the inflammation left the urethra and alighted on the epididymis. Another, that the epididymitis was only a form of that rheumatoid inflammation which attacks other organs and tissues. More complete observation, however, has shown that the supposed examples of metastasis are really instances of progressive inflammation along the vas deferens to the epididymis. The arguments on which the theory of progressive migration along the vas is based are the following:—(*a*) In all or almost all cases where the patient is examined early the cord is found swollen and tender before the epididymis shows such signs. In connection with this may be mentioned the fact that Terrillon,[3] in his experiments on dogs, found that in the earliest stage of inflammation the mucous membrane of the vas deferens showed all the signs of catarrhal

[1] Dron: Lyon Médical. 1 Juillet, 1877.
[2] Jullien: Maladies Vénériennes. 1879, p. 104.
[3] Terrillon: Bulletin de la Société de Chirurgie. 1881. No. 2, pp. 119 and 155.

inflammation at a time when nothing abnormal could be felt by palpation of the cord. (*b*) In some cases the cord alone is affected, the swelling and tenderness not reaching the epididymis at all. (*c*) The body of the testis is never attacked, except consecutively to the epididymis, which is in direct connection with the urethra. (*d*) Lastly, epididymitis rarely occurs until at least a fortnight after the beginning of the urethritis that gives rise to it.

It is true that Castelnau,[1] F. R. Sturgis,[2] and others, have reported cases where epididymitis appeared to precede the urethral discharge, but it is by no means proved in any of their cases that gonorrhœal contagion was the cause of the epididymitis.

Pathological Anatomy.—The changes caused by acute epididymitis have only been observed in a few instances, death during this stage being of very rare occurrence.

Gaussail[3] has published an account of the appearances found in two patients, who died from other causes during an attack of acute gonorrhœal epididymitis. The first case was one of double epididymitis, the right side having been inflamed ten, and the left five, days. The vesiculæ seminales were swollen and hard, and the portion near the ejaculatory duct, especially on the left side, deep reddish black in colour. Their interior contained a quantity of whitish yellow material. The vasa deferentia were increased in size throughout their extent; their cavity also was diminished, and appeared to be blocked by material similar to that found in the vesicles. The vessels about the vasa deferentia were redder and more dilated than natural. Both epididymes were voluminous, hard, and of a wine-lees colour; but the changes were more marked on the left side. Both contained material like that found in the seminal vesicles. The testes showed no morbid change except injection of the small blood-vessels in the left one; the tunica vaginalis on this side also contained a little reddish serosity. The bulbous and prostatic portions of the urethra showed slight traces of inflammation. In the second case, in which the right organ was affected, the post-mortem appearances were similar to those found in the first, except that the contents of the vesiculæ seminales were not yellow; the tunica albuginea also was somewhat thickened and very vascular.

The morbid anatomy is also described by Curling,[4] who bases his

[1] Castelnau: Annales des Maladies de la Peau et de la Syphilis. 1844.
[2] Sturgis: New York Med. Record. 1875, Oct. 9. See also Velpeau: Art. Testicule. Dictionnaire de Méd. Vidal, Ann. de Chirurgie. 1844. Stansbury: Archives of Dermatology. 1877. April.
[3] Gaussail: Archives Gén. de Méd. 1831. Tome xxvii., p. 198.
[4] Curling: Diseases of the Testis, 4th edit. 1878, p. 249.

description on the changes observed by himself in two cases of acute epididymitis, and on those found by Gaussail. "The tunica vaginalis is more or less distended with lymph, or albuminous matter infiltrated with reddish serum, which forms loose adhesions between the opposed surfaces of the membrane; these adhesions are so slight as easily to admit of being broken down with the finger. The membrane is injected with a multitude of minute red vessels which ramify in various directions and form a compact network. At a later period red vessels may be traced proceeding from the free surface of the tunica vaginalis to the false membranes forming the adhesions. The volume of the testicle is very little if at all increased, the great bulk of the tumour being occasioned by the swollen epididymis and effusion into the serous sac. When cut into, the gland appears somewhat darker than natural, from a congested state of its vessels. The epididymis, particularly the lower part, is enlarged to twice and sometimes thrice its natural size, and feels thick, firm, and indurated. This enlargement is produced by the exudation of a brownish substance in the connective tissue between the convolutions of the duct. The coats of the vas deferens are thickened, and the vessels ramifying near them injected, sometimes along the whole extent of the duct. Plastic matter is found in the connective tissue around a tortuous part of the vas deferens and the tail of the epididymis, which frequently forms the bulk of the swelling observed in these cases."

In a case where a post-mortem examination was made by Gosselin[1] twenty-six days after the commencement of the attack, the testis, vasa efferentia, and globus major of the epididymis were healthy, but the globus minor was enlarged, hard, and firm. Section showed it to be yellow and free from vascularity. The duct was much enlarged, but impervious, being filled with a yellow material, which also infiltrated the walls of the convoluted vas deferens. Under the microscope the yellow substance was found to consist of granular cells, fatty globules, and débris.

Adhesions of the tunica vaginalis are common in cases of old epididymitis. Nodules of lymph are also sometimes found. Bumstead and Taylor[2] have observed them post mortem in several cases. These authors also state that in one instance the nodules were so distinctly palpable through the skin, that they resembled those produced by cancer.

Brodie[3] examined the testicle of a gentleman who had suffered from gonorrhœal inflammation twenty years before. On making a section of the organ, Brodie found that "about two thirds of the

[1] Gosselin: Gazette des Hôpitaux, Decembre 21, 1854; also Gosselin's translation of Curling's "Diseases of the Testis."
[2] Bumstead and Taylor: Venereal Diseases, p. 144.
[3] Brodie: London Med. Gazette. 1834. Vol. xiii., p. 219.

tubuli testis remained in their natural condition, while the remainder had become converted into a white substance, having the consistence but not the fibrous structure of ligament."

Terrillon,[1] in his paper on the pathological anatomy of epididymitis, divides the changes which take place in the vas deferens into four degrees or stages: (1) The mucous lining alone of the vas deferens is attacked, and presents the ordinary characters of catarrhal inflammation. The epithelium loses its cilia, and the submucous tissue becomes swollen and infiltrated with lymph cells. In this stage the vas deferens shows no increase of size when examined externally. Thus clinically it may escape observation. (2) Much more frequently inflammation extends to the walls of the vas deferens, which may swell twice or three times its normal size. (3) Inflammation may spread to the cellular tissue of the cord, the whole becoming welded into a mass of which the separate elements cannot be recognized. (4) The inflammation reaches also the connective tissue and the scrotum.

Causes.—Among the most frequent exciting causes of gonorrhœal epididymitis are sexual excitement, excess in drink, strong injections —such, for example, as are sometimes used in the abortive treatment of gonorrhœa—and violent or prolonged bodily exertion—riding, dancing, and the like, particularly if the patient neglect to wear a suspensory. The passage of instruments along the urethra also sometimes sets up epididymitis. Specific remedies, such as copaiba and cubebs, and injections of ordinary strength, judging by Le Fort's[2] statistics of 576 cases, have no influence in producing epididymitis.

Although in many cases one or more of the foregoing influences have been at work, it must be remarked that in a large number no exciting cause—except, of course, the spread of the inflammation to the prostatic urethra—can be ascertained; for epididymitis not unfrequently attacks a patient who has followed the most careful treatment.

The time at which epididymitis appears, varies much in consequence of the variety of circumstances on which it may depend. Among 222 cases collected by Fournier,[3] the affection is set down as occurring between the third and fifth weeks in ninety-three. Of the rest, twenty began before the fourteenth day, and the remainder at periods varying from two months to several years, some happening so long after the urethritis that the epididymitis would seem to have had no direct dependence on it, but was more probably due to stric-

[1] Terrillon: Bulletins et Mémoires de la Soc. de Chirurgie. 1881. No. 2, pp. 119—155.
[2] Le Fort: quoted by Jullien, Maladies Vénériennes, p. 106.
[3] Fournier: loc. cit., p. 209.

ture, which is by no means a rare cause of epididymitis. A larger statistic furnished by Jullien shows that the commonest time for the appearance of epididymitis is towards the fourth week after the appearance of the discharge. According to our own experience at the Lock Hospital, the most frequent period for the affection to set in is during the third week.

Symptoms.—In the majority of cases the first symptom of epididymitis is a feeling of discomfort, sometimes amounting to actual pain, in the groin of the side about to be attacked. Sometimes also a dragging sensation, beginning at the loin and extending along the course of the spermatic cord, is complained of. In a short time the epididymis itself becomes tender and somewhat enlarged. In some instances the pain is first felt in the affected organ; but in any case it soon grows exceedingly tender, and much pain is felt when the patient walks, stands, or even moves from side to side. Not uncommonly the swelling extends upwards along the cord to the abdominal ring, and in rare instances the cord may enlarge to such a degree that it becomes compressed by the pillars of the external ring. This gives rise to nausea, vomiting, and other symptoms closely resembling those produced by a strangulated hernia. Not unfrequently, when the epididymitis has been in action for a few days, there is considerable constitutional disturbance. The tongue gets dry and furred, and the temperature rises, in some cases reaching 102° or higher. Thirst also is often a prominent symptom, and constipation is common. Frequent nocturnal emissions are mentioned by Jullien as being an additional source of distress during the course of epididymitis. In some cases the pain attending epididymitis is exceeding acute, without implication of the testis itself or other obvious cause. Gosselin [1] has described several such cases under the title of the *neuralgic form of epididymitis*. The urethral discharge gradually grows less and less as the inflammation advances, to return again on the subsidence of the epididymitis. If the inflammation spread to the body of the testis, the pain becomes excruciating, sometimes almost driving the patient into delirium by the agony it causes.

On examination, the epididymis is found swollen, overlapping the testis, and much enlarged at the lower part, for the globus minor is most affected by the inflammation. Sometimes serous effusion into the tunica vaginalis is so abundant that most of the swelling is due to it, and the fluid is so rapidly poured out that its pressure causes acute anguish. As the inflammation proceeds the distended scrotum becomes smooth, red, and shining, and

[1] Gosselin: Clinique Chirurgicale de l'Hôpital de La Charité. 1873. Tome ii.

the cord swollen and painful on the affected side. Thus the swelling is due sometimes chiefly to the enlarged epididymis, sometimes to the effusion of the tunica vaginalis, sometimes to the œdema and congestion of the cord and scrotum.

In the course of four or five days the pain lessens, and the patient no longer suffers as long as he remains perfectly quiet. The swelling soon afterwards diminishes, first by reabsorption of the fluid effused, and then of the solid enlargement; but this is exceedingly slow to depart. The whole duration of the acute congestion ranges between ten and twenty days. Relapses are common, especially in persons who are not able to rest completely during the acute stage, or in those who indulge in venery, or other excess. Instead of relapsing in the same testis, the inflammation changes sometimes to the other side, which is affected in its turn. This may happen several times, the two organs being attacked alternately, and giving rise to the condition termed by Ricord "*epididymite à bascule.*"

The description just given is that of an acute attack of epididymitis; but in many cases the inflammation runs a subacute course, and the patient suffers very little pain throughout, except when the organ is handled, or during exercise. Indeed, the majority of hospital patients follow their occupation during the whole course of the affection.

The chief *seat* of the inflammation in acute epididymitis is the globus minor, whence the swelling usually spreads to the whole epididymis, but as a rule the body and globus major are affected to a less degree than the globus minor. From the epididymis the inflammation extends nearly always to the tunica vaginalis, and occasionally to the tunica albuginea and substance of the testis itself. Of 1342 cases observed by Sigmund,[1] the epididymis alone was affected in 61; the epididymis and cord in 108; the epididymis and tunica vaginalis in 856; and all three parts in 317. Of Dron's 726 cases the body of the testis was affected in only ten; and of Hardy's[2] 226 cases the inflammation attacked the testis proper in but nine.

The cellular tissue of the cord and scrotum is also generally more or less congested and swollen. The vas deferens, though the channel by which the inflammation travels to the epididymis, loses in most cases the acuteness of its inflammation when the latter is reached. Sometimes, however, the cord remains much swollen and very tender, and appears to be affected more than the epididymis.

In the subacute form and in cases of relapse, only a part of the

[1] Sigmund: Wiener Med. Wochenschrift. 1856. No. 12; and Brit. and Foreign Med. Chir. Rev. Oct. 1856, p. 544.

[2] Hardy: Etude sur les Inflammations du testicule. 1860.

epididymis, usually the tail, may be enlarged. In rare cases again, the vas deferens may be affected while the epididymis remains free (*déférentite*). Kohn[1] and Gosselin[2] have recorded such cases. In that of the latter the inflammation was subacute. The vas deferens formed a round hard cord as large as the little finger, which could be traced from the upper and back part of the testis as far as the internal abdominal ring. In other cases the whole of the constituents of the cord are attacked (*funiculite*). Lastly, in chronic cases connected with stricture or other lesion of the urethra, the swelling may affect only a circumscribed portion of the epididymis, which can then be felt as a nodule, usually in the tail but sometimes in the body or head.

The usual *termination* of epididymitis is gradual and complete resolution, but some induration of the epididymis, especially of the globus minor, always remains for a long time, and indeed in some cases is permanent. Less frequently the whole epididymis, the vas deferens, the testis and the tunica vaginalis, separately or together, remain the seat of chronic inflammation.

The persistent enlargement of the globus minor has been found by Gosselin[3] and others to render the patient sterile by blocking up the excretory duct of the testis at that point. In nineteen patients who had suffered from double epididymitis, and in whom this thickening remained, he found that, though the patients retained desire and capacity for sexual intercourse, and their semen was unaltered to the naked eye, the microscope showed it to be entirely destitute of spermatozoa. The testicles in these persons were apparently quite healthy, neither swollen nor atrophied. Curling[4] also gives cases showing how liable epididymitis is to cause sterility if both sides are affected, or even if only one organ is attacked, in cases where the remaining organ is incapacitated from any other cause.

Liégeois[5] examined the semen of twenty-three patients who had had double gonorrhœal epididymitis, and found that in twenty-one no spermatozoa were present. As regards the permanency of sterility the same author has collected twenty-five cases reported by Gosselin, and thirty-five by Godard, which, with his own twenty-three, amount to eighty-three cases. Of all these, return of the spermatozoa was noted in only eight, showing the serious effect of double epididymitis on the procreative power of the patients.

[1] Kohn : Wiener Med. Presse. 1870. No. 17.
[2] Gosselin : loc. cit., p. 367.
[3] Gosselin : Archives Générales de Médecine. September, 1853, p. 257. See also idem, 4me série. 1847 ; tom. 14, p. 405, tom. 15, p. 40.
[4] Curling : loc. cit., p. 474, et seq. ; also Brit. and Foreign Med. Chir. Review. 1864.
[5] Liégeois : Annales de Derm. et de Syph. 1869. Vol. i., p. 410.

Terrillon[1] has lately investigated this subject, and his views strongly support those of Gosselin and Liégeois as to the frequency with which spermatozoa are absent from the semen in epididymitis. This writer also further insists on the alteration in colour of the semen in such cases; and states that it was present in the whole of the cases—about twenty-five—which he had examined. The semen has a yellowish tint, sometimes even greenish, is of a purulent aspect, and contains numerous pus corpuscles and large granular cells. This alteration persists for a variable time. Thus Terrillon considers the morbid change to be a purulent catarrh of the seminal ducts.

Among the *complications* that may arise during the course of epididymitis *abscess* may be mentioned. This is never extensive, and soon heals after the matter has escaped. In rare instances again acute epididymitis is followed by tuberculous or pseudo-tuberculous degeneration in persons of weakly constitution. *Gangrene of the Scrotum* occasionally but very rarely occurs, probably as a consequence of extreme distension. Reuss[2] reports a case which came under his own observation, and alludes to others. Reuss's patient was a weakly man aged 44, but not of tubercular diathesis, who suffered from double epididymitis accompanied by great pain and distension of the scrotum, which he refused to have punctured. Two days afterwards a black spot appeared at the lower part of the scrotum on the right side. The gangrene extended until it had destroyed the whole of the right half of the scrotum, laying bare the testis; but in a few weeks cicatrisation took place under simple treatment. *Atrophy of the testicle* is a rare termination. Gosselin[3] has only once seen it follow gonorrhœal inflammation. It must be remembered, however, that the testis proper is rarely attacked. Gosselin also reports a case in which abscess occurred in the testis itself. In this case the whole of the gland was gradually evacuated through the opening. Another termination of parenchymatous orchitis following gonorrhœa has been described by the same author[4] under the title of '*orchite ulcero-gangreneuse indolente*.' The testis becomes adherent to the scrotum, which then ulcerates, and more or less of the contents of the testis escape. We have never seen this termination.

In some cases of epididymitis, particularly after prolonged or repeated attacks, an irritable or painful condition of the testis remains which is very difficult to get rid of. The organ itself may be merely unduly sensitive without any obvious morbid condition, or

[1] Terrillon : Annales de Derm. et de Syph. 1880. No. 3, p. 441.
[2] Reuss : Journal de Thérapeutique. 1880. 25 Mars.
[3] Gosselin : Clinique de l'hôpital de la Charité. Tome ii. p. 389.
[4] Gosselin : Gazette des Hôpitaux. 1861. 31 Juillet.

the pain may radiate along the groin and loin and cause such an amount of suffering that the patient is incapacitated from following his occupation. To such cases the terms *irritable testis* and *neuralgia of the testis* have been applied. Sometimes a small amount of induration of the epididymis remains and is exquisitely tender; at other times varicocele is present. Patients of highly nervous temperament and those who are anæmic are most likely to suffer from these affections.

There still remain to be mentioned certain complications of epididymitis due to the implication of neighbouring structures or to some anomaly connected with the testis or epididymis itself.

Peritonitis occasionally occurs by extension of the inflammation from the vas deferens to the peritoneum. Gosselin [1] reports a case in which symptoms of peritonitis preceded those of epididymitis, but disappeared when the epididymis became swollen. The same author refers to two cases published by Peter [2] in which peritonitis occurred with epididymitis and terminated fatally. Faucon [3] also relates a case of epididymitis in which with grave general symptoms a swelling formed at the internal abdominal ring and spread outwards towards the iliac spine. This was diagnosed to be a subperitoneal abscess, and it was incised. No pus escaped, but the patient recovered. Rougon [4] noted the case of a soldier who died of acute peritonitis and who was at the time suffering from right epididymitis. This case however is incomplete, as the patient was moribund when he came under observation, and the autopsy did not establish conclusively the connection between the two diseases.

Gosselin [5] describes one case and refers to another in which he diagnosed inflammation of the *vas aberrans* in connection with gonorrhœa. In both cases the swelling disappeared in a few days without any other treatment than that directed against the urethritis.

When epididymitis occurs in a subject with *inversion of the testis* the chief part of the swelling is of course in front, instead of behind as in ordinary cases. The epididymis, again, in rare instances is placed at one or other side or above the testis, and the shape of the swelling will then vary according to its position.

Undescended or misplaced testes are occasionally attacked by inflammation.[6] Ledouble [7] states that if epididymitis attack a person

[1] Gosselin : Clinique de l'hôpital de la Charité. 1873. Tome ii., p. 364.
[2] Peter : Union Médicale. 1856. No. 141, p. 562.
[3] Faucon : De la péritonite et du phlegmon sous-peritonéal d'origine blennorrhagique, Archives Gén. de Médecine. 1877. Tom. ii., pp. 385 et 545.
[4] Rougon : Union Médicale. 30 Avril, 1878.
[5] Gosselin : loc. cit., p. 379.
[6] For examples see Godard : Etudes sur la Monorchidie et la Cryptorchidie chez l'homme. 1857, p. 87 et seq.
[7] Ledouble : Revue méd. française et étrangère. 3 Jan. 1880.

with any anomaly of the kind, the inflammation nearly always affects the displaced organ. Such cases are of especial importance, on account of their liability to be mistaken for hernia and other diseases. Some years ago a young man was admitted into University College Hospital with obstinate constipation, stercoraceous vomiting, fever, and great tenderness of the abdomen, especially of the left flank and inguinal region. The right testis was present in the scrotum; but the left could not be discovered, either in the scrotum or inguinal canal. The man had been suffering from urethritis for several weeks. After death, which occurred in three days, extensive peritonitis was found to have originated round a small inflamed testis which lay close to the internal ring. We have also seen a case in which suppuration of a testis situated in the inguinal canal occurred as a sequence of gonorrhœa. In this case an incision let out a considerable quantity of pus, and the man recovered. In a case of inflamed testis in the groin reported by Johnson Smith,[1] rapid recovery followed a deep stab into the imprisoned organ. An example of orchitis in a *cryptorchid* came under the care of Simonnet[2] in the Midi Hospital. Before the occurrence of the inflammation no testis could be discovered, but afterwards a hard lump was felt at the orifice of the right internal ring. Recovery took place.

Besides the preceding class of cases there are certain rare instances in which the epididymis descends into the scrotum while the body of the testis remains in the inguinal canal. A case of epididymitis under these circumstances was observed by Gosselin,[3] and the tumour was at first mistaken for an epiplocele. An elongated swelling about the size of the thumb extended from the bottom of the scrotum to the abdominal ring, where the testis proper could be felt. Rapid recovery took place under soothing treatment and rest in bed.

Epididymitis of the organ when situated in the perinæum has been twice observed by Ricord.[4] He states that in one case he mistook the swelling for an abscess of Cowper's gland, and was about to open it when, the corresponding half of the scrotum being found empty, the true nature of the case was made out.

The Diagnosis of epididymitis is usually easy. The swelling and pain are of recent origin, and have been preceded by urethral discharge. The epididymis can be felt enlarged, independently of the testis; if the latter be also enlarged, it is only slightly so. The tenderness on pressure is much greater in the epididymis than in the

[1] Johnson Smith: Lancet. 1872. Vol. i., p. 468.
[2] Simonnet: Gazette des Hôpitaux. 14 Avril, 1874.
[3] Gosselin: loc. cit., p. 384.
[4] Ricord: quoted by Godard: loc. cit., p. 96.

testis itself. The rare form of congestion of the epididymis which occurs in early syphilis is distinguished by its comparative painlessness, by the absence of urethral discharge, and by the presence of other signs of syphilis. Scrofulous disease usually begins in the upper part of the epididymis and has a very different history, being of slow growth, and not acutely painful. When epididymitis attacks an undescended or misplaced organ much perplexity may be caused before the true cause of the swelling and pain can be discovered. But the nature of the case may be suspected if the testis is not in the scrotum, and the patient has had a urethral discharge recently. In cases of inversion of the testis the presence of the vas deferens in front of instead of behind the other constituents of the cord will at once solve the difficulty. When the body of the testis becomes involved the regular rounded shape of the anterior portion of the swelling, the extreme tenderness on pressure, and the very severe pain and constitutional disturbance, will suffice for the diagnosis.

Prognosis.—The prognosis of epididymitis is very favourable in the great majority of cases. Resolution is by far the most usual termination without ill consequences, especially if the body of the testis have escaped, and even if this have been implicated, atrophy rarely occurs.

When both organs have been inflamed, however, the question of the procreative power of the patient becomes a most important one. The researches of Gosselin, Godard, Curling, Liégeois, and Terrillon which have been already noticed show that when both organs have suffered, the semen is temporarily and sometimes permanently deprived of spermatozoa. The presence of any nodule of the epididymis, especially of the globus minor, would of course lead to caution in prognosis; but it must not be concluded on the other hand that the procreative power remains intact because the epididymes have apparently regained their normal state. When it becomes a question of deciding as to fitness for marriage, the semen should be examined under the microscope. This is the only true test, for sterile patients may retain the full power of sexual intercourse, and the ejaculated fluid appear normal to the unaided eye. Neither does the testis itself undergo any morbid change, even though obstruction of the efferent duct be complete. It must not however be concluded that a man is hopelessly sterile because spermatozoa are absent at one particular time. The fluid should be examined several times before a positive opinion is expressed. If in such cases induration of the epididymis be present, measures should at once be adopted with a view to its dispersion. It must be remembered that the head of the epididymis is composed of the vasa efferentia, from twelve to twenty in number, while the tail consists

only of a single convoluted tube; thus induration in the latter would be much more likely to cause obstruction than in the former. If acute epididymitis light up tubercular disease in a patient of that diathesis the prognosis is grave, and will depend on the course pursued by the tuberculosis.

Treatment.—In treating epididymitis the first thing is to make the patient keep his bed. If he cannot do this the testis must be thoroughly supported in a suspensory bandage. The ordinary apparatus sold for the purpose is useless at this stage, and a large handkerchief should be arranged in the following way. It should first be folded so as to form a triangle, and a broad piece of tape stitched to the centre of the base of the triangle, which is placed behind the scrotum. The tape is then carried between the nates and fastened to a band round the waist. The two lateral corners of the handkerchief are carried along the groins and fastened to the waist band on each side by means of safety pins. The apex of the triangle is then drawn firmly up in front and fixed to the band in the same way. The tape behind prevents the bandage from slipping forwards, and thus the scrotum can be efficiently supported, however great the swelling may be. Another way of supporting the parts when the patient is recumbent is by stretching across the thighs a piece of adhesive plaster, two feet long and four inches wide. The testes thus lie on a shelf. After a free purge, a saline draught with sedatives, such as fifteen or twenty grains of citrate of potash with small doses of opium or henbane (F. 46), should be taken every four hours. If there be much constitutional disturbance a small quantity of antimony may be also given until the pulse becomes soft and the skin moist. The diet must be mild and unstimulating. In strong vigorous patients venesection to eight or ten ounces gives great relief when there is much fever, but is seldom resorted to at the present day. The local abstraction of blood by leeches, or by puncturing the scrotal veins after they have been distended by hot fomentations is frequently beneficial. In the majority of cases of simple epididymitis the best local application consists in a combination of sedatives with heat and moisture. A cream composed of equal parts of extract of belladonna and glycerine is smeared thickly on a piece of lint large enough to envelope the scrotum, and over this flannels wrung out of very hot water are applied and changed every two hours. The scrotum must be supported on a small cushion placed between the thighs, or by the bandage already described. Hot hip baths may also be taken at night (104° F.), but the patient should stay in only five or ten minutes. Among many other soothing applications for epididymitis tobacco is strongly recommended by

some American surgeons, especially by Van Buren and Keyes.[1] The tobacco is made into a poultice with elm bark and linseed. A strong lotion of lead and opium applied warm on lint and covered with oiled silk is a very efficient application in cases where the regular fomentation cannot be carried out. Iodoform[2] with vaseline (a drachm to the ounce) is also stated to have been used with good effect.

When the inflammation spreads to the testis itself, as manifested by the agonising pain and the enlargement and extreme tenderness of the body of the organ, cold applications commonly give much relief. For this purpose ice may be applied after the method advised by Diday,[3] who strongly recommends this mode of treatment. The ice should be put into two india-rubber bags or bladders, one of which is to be placed beneath, and the other on the top of the testis as the patient lies on his back. The ice must of course be renewed as often as it melts, and, if it give relief, should be continued for twenty-four hours or longer according to the nature of the case. If the pain is not materially relieved in an hour or two the ice should be discontinued and warmth applied; but the change from cold to heat must be gradual, otherwise sloughing of the scrotum may be caused. Another method of applying cold is by continuous evaporation of ether, carried out by dropping the ether on a single fold of lint placed on the scrotum. Assadorian[4] states that he has had good results from this mode of treatment. Another method of applying continuous cold is by means of Leiter's soft metal coil, through which water of any required temperature can be kept circulating.

If the tunica vaginalis be very tense, it should be punctured and the fluid allowed to escape through a cannula or into the scrotum. One of the best ways of relieving tension is that recommended by Velpeau and advocated by Bumstead[5] among others. The swelled testis is grasped by the surgeon with the left hand, and a lancet is rapidly plunged into the tense tissue of the scrotum and tunica vaginalis to the depth of half an inch in several places. Thus a free vent is given to the fluid effused into the serous sac, and relief to the pain immediately follows. The relief given by puncture of the distended tunica vaginalis has led some surgeons[6] to extend the puncture—or even incision—deeply through the tunica albuginea in all cases of swelled testicle, averring that it never does harm and in nearly all cases greatly reduces the pain.

[1] Van Buren and Keyes: loc. cit., p. 424; also Keyes: Venereal Diseases, p. 284.

[2] See Alvarez: La Independencia Medica, and Lond. Med. Record, November, 1877. Sabadini: Gazette des Hôpitaux. 1881. No. 18.

[3] Diday: Thérapeutique des Mal. Vén. 1876, p. 96.

[4] Assadorian: Amer. Journal of Syph. and Derm. 1870, p. 216.

[5] Bumstead: American Practitioner, March, 1878, p. 138.

[6] See Vidal (de Cassis), Maladies Vénériennes. 1853, p. 76; and Henry Smith: Lancet, January, 1876.

While it is beyond doubt that in cases of severe pain from tension of the serous sac or of the fibrous tunic of the testis great relief may be given, it is equally clear that in cases where the pain is chiefly due to the swelling of the epididymis or cord puncture will be of little or no service. Hence puncture is useful when the pain is severe and caused by an overcharged serous sac or an inflamed and swollen testis; but of little or no benefit under other circumstances.

Local counter-irritation is employed by certain surgeons in the early stages of epididymitis. For example, Furneaux Jordan [1] paints the scrotum of the affected side with a solution of nitrate of silver of two drachms to the ounce. A very old method, but one in which we have no faith, consists in the application of mercurial ointment to the scrotum. More useful, especially when the patient is compelled to move about, is the application of contractile collodion freely to the scrotum: the ether acts as a counter-irritant, and after its evaporation a thick film is left on the skin. This contracts and slightly compresses the parts within. The collodion may be applied once or twice daily while the acute stage continues.

After the acuteness of the inflammation is over, the patient may get up, the testis being well supported in a suspensory bandage lined with wadding.

Pressure by strapping was first employed by Fricke of Hamburg from the beginning of the inflammation, and sometimes it checks the swelling, and alleviates the pain; but it often fails. It is little used now in the early stages, though it has been lately again advocated by Thiry.[2] If used at this stage it should be applied at the very outset, before there is much swelling; but, as a rule, pressure should not be employed until acute inflammation is over. The following method of strapping the testis may be adopted. A number of strips of adhesive plaster are cut, about twelve inches long and half an inch wide, and dipped in hot water when ready to be applied. The scrotum having been first shaved, the swollen testis is drawn away from its fellow, and the left fore-finger and thumb grasp the cord above it, including as little of the scrotum as possible. One strip is then rolled round the cord below the thumb and finger to isolate the testis; another strip is then taken and passed tightly along the middle of the testis from the back to the front of the first circular band. In doing so it compresses the testis firmly against the circular strip; another vertical strip is then applied at the side of the first, overlapping about half its width. By a repetition of these vertical strips, the testis is enclosed in a sheath of plaster. They

[1] Furneaux Jordan: Brit. Med. Journal, Feb. 6, 1869.
[2] Thiry: Presse Médicale Belge. 1876—7.

are then all kept in place by a long strip wound spirally round them from above downwards over the mass, till a second coat is thus added to the sheath. The application must be renewed every two or three days, as the epididymis rapidly shrinks in its case. Pressure may be employed alone, or coupled with mercurial or other stimulating ointments, which may be applied to the scrotum before the plaster is put on. Of late we have abandoned the use of strapping in both acute and chronic epididymitis.

Besides strapping, other methods of compressing the testis have been suggested: for instance, by various kinds of suspensories, of which the size can be gradually lessened by the adjustment of tapes;[1] by a vulcanite shield the pressure of which can be regulated by lacing;[2] also many other devices of greater ingenuity than practical value. Even pressure by the hand has been recommended.[3]

During the later stages of epididymitis, iodide of potassium in doses of three to ten grains, twice or thrice daily, is of great service. By this means absorption of the hard nodules of the epididymis is aided and the normal condition of the organ is in many cases restored. The researches of Gosselin and others, already mentioned, show how frequently sterility is caused by double epididymitis, and consequently how important it is to endeavour to disperse the hardening of the epididymis, which obstructs the efferent duct. Gosselin was successful in two cases where the induration had lasted three and nine months respectively, in removing the enlargement of the globus minor; spermatozoa also reappeared in the semen. Curling succeeded in curing a man who had been sterile for two years.

In the rare cases where matter forms in the cellular tissue of the epididymis or in the testis, the abscess should be freely opened as soon as fluctuation is distinct, after which support should be afforded by a closely fitting suspensory bandage.

In *chronic* epididymitis, which follows repeated relapses and is mostly connected with stricture of the urethra or some morbid condition of the prostate, active treatment is seldom necessary. A few days' rest, a well-fitting suspensory, and treatment of the urethral lesion, are the chief points to be attended to. In pseudo-tubercular or tubercular degeneration of the epididymis, the general treatment suitable to the diathesis must of course be carried out.

The treatment of the troublesome cases in which neuralgic pains radiate along the groin, thigh, loin and sometimes other parts of the body after epididymitis, is in some cases very unsatisfactory. When the pain is intermittent, quinine in large doses sometimes has a good

[1] Miliano, quoted by Bumstead and Taylor: loc. cit., p. 151.
[2] White: Boston Med. and Surg. Journal, Jan. 29, 1880.
[3] Haley: Australian Med. Journal, April 15, 1880.

effect. In obstinate cases arsenic with iron may be tried. Sea bathing, followed by vigorous rubbing of the skin, is often beneficial. When the pain is very severe, sedatives will be necessary. A belladonna and opium liniment may be applied, but in some cases subcutaneous injection of morphia may be required. Dron[1] states that he has seen good results from the subcutaneous injection of simple water in such cases. Improvement of the general health is in all cases most important.

Gonorrhœal Rheumatism.—The occurrence of rheumatoid affections of the joints and other fibrous and serous structures has been studied with more or less attention since Swediaur published his observations of swelling of the knee during gonorrhœa. Jullien[2] attributes to Forestus the credit of the earliest record of disorder of the knee during gonorrhœa, some two hundred years before Swediaur. Since Swediaur's time, however, a long array of writers, including Sir Astley Cooper and Sir Benjamin Brodie, have laboured on this subject, without as yet arriving at any general agreement concerning its nature. The following comprise the several views or theories of the nature and origin of gonorrhœal rheumatism which have more or less currency at the present time. 1. By some authors it is maintained that the joint-affection depends upon gradual vitiation of the blood by the continuous absorption into the system of a poison generated by the urethral inflammation—in other words, that it is allied to pyæmia. Paget[3] and Wilks and Moxon[4] hold this view; but it does not explain those cases where the joint-affection subsides even though the urethral discharge remains, nor other cases where, the discharge having stopped, the rheumatism continues. 2. Another view is that gonorrhœal rheumatism is a special disease, quite distinct from all other forms of arthritis. Rollet,[5] Fournier,[6] Gosselin[7] and others repudiate any connection between gonorrhœal arthritis and the rheumatic diathesis. The gonorrhœal affection is even, according to some, opposed to ordinary rheumatism. Brandes,[8] for example, believed that if a patient had undergone an attack of gonorrhœal joint disease, he would not afterwards suffer from ordinary acute rheumatism.

By those who reject the connection with rheumatism the nature of the disease is variously explained. Some, like Swediaur and Bonnet,

[1] Dron : Lyon Médical, 1 Juillet, 1877.
[2] Jullien : loc. cit., p. 216.
[3] Paget : Clinical Lectures and Essays, 2nd edit., 1879, pp. 176 and 360.
[4] Wilks and Moxon : Path. Anatomy, p. 70.
[5] Rollet : Mal. Vén. 1865, p. 341, *et seq.*
[6] Fournier : Nouveau Dict. de Méd. et de Chir. pratiques. Art. Blennorrhagie ; also Annales de Derm. et de Syph. 1869. Tome i., p. 1.
[7] Gosselin : Gaz. des Hôp. 1877. No. 108, p. 472.
[8] Brandes : Du rheumatisme blennorrhagique, Gaz. Méd. de Paris. 1855, p. 201.

maintain that the inflammation of the joints depends upon metastasis of the inflammation from the urethra to the synovial membranes. But this suggestion is rendered untenable by the fact that the urethral discharge, though in some cases it diminishes during the acute stage of the arthritis, ceases absolutely in few. On the contrary, it may remain unabated during the whole course of the arthritis. Tixier[1] put forward the hypothesis that the gonorrhœal poison affects the system somewhat similarly to scarlet fever; and that the suppuration of mucous membranes forms its exanthem. In his opinion the arthritic and other affections of gonorrhœa are simply sequelæ of a gonorrhœal diathesis. This hypothesis is overset by the fact that arthritis may follow urethritis which has no gonorrhœal origin, for example—that set up by the irritation of a catheter or other foreign body. This fact suggested the theory that it is a reflex affection excited by urethral irritation.

Lastly, there remains the opinion that gonorrhœa excites these affections only in those of rheumatic or gouty diathesis; and the more the natural history of the affection is explored the more evidence is collected which supports this view. One objection of much apparent force has been put forward, namely, that gonorrhœal rheumatism is not infrequent in persons who are not aware of having suffered from ordinary rheumatism or gout. But this objection appears to be more specious than real. In the first place, so far as our own investigations have led us, we have generally found a family history of rheumatism or gout—most frequently the former—in those patients who suffer from arthritis during gonorrhœa, while the number of those attacked by gonorrhœal rheumatism who have suffered from simple rheumatism previously is considerable. Among such persons doubtless there are also instances of ordinary acute rheumatism co-existing with gonorrhœa, in whom the latter has had no share in producing the joint affection. Hutchinson[2] strongly maintains the presence of a rheumatic or gouty tendency in those who suffer from gonorrhœal rheumatism, but explains the modus operandi by suggesting that, given the rheumatic or gouty diathesis, almost any urethral or even genital disturbance may excite arthritis similar to that accompanying gonorrhœa—hence that this form of arthritis is in all cases a reflex neurosis excited by irritation. Ord[3] had also previously advanced this reflex neurotic causation.

The frequency of rheumatism in gonorrhœal patients is variously estimated, but no accurate statistic is attainable owing to the fact

[1] Tixier: L'Union Médicale. 1866. Dec.
[2] Hutchinson: On some of the surgical aspects of gout and rheumatism. Med. Press and Circular. July 7, 1880.
[3] Ord: Brit. Med. Journal. 1880. Vol. i., p. 155.

that the influence of gonorrhœa in exciting rheumatic affections elsewhere than in the joints has not been fully studied. Rollet[1] noted that of 2423 persons 68 had rheumatism; Dron[2] found that of 2041 males 40 had rheumatism.

Gonorrhœal arthritis has been observed in nearly all, if not all the joints, but has a great predilection for the knee. Besides the joints, the sheaths of the tendons, the plantar and palmar fasciæ, the bursæ, the sclerotic, the iris, the great sciatic nerve, the heart and its pericardium, are all with different frequency attacked by gonorrhœal rheumatism.

The affection is much more frequent in men than in women, though the difference in the two sexes is less than is generally supposed. Indeed, Duplay[3] states that of twenty-four cases of gonorrhœal arthritis observed by him, twelve were in women. The difference of frequency is partly explained by the less frequency of urethritis in women than in men. Certain authors maintain that if a woman has gonorrhœal rheumatism, the urethra is always inflamed. Hutchinson however does not require that the urethra shall be inflamed in all cases of gonorrhœal rheumatism: for him genital irritation is sufficient to excite these affections in persons of the rheumatic or gouty diathesis.

The causes of gonorrhœal rheumatism are obscure. Let it be granted that the rheumatic and gouty diatheses are the leading predisposing causes, and that urethritis of the deeper portion of the urinary canal is the main exciting cause. Certain other influences appear to act as determining causes. These are, exposure to damp and cold, alcoholic excess and other well-known provocatives of ordinary rheumatism and gout. There appears to be no connection between the abundance or scantiness of the urethral discharge and the occurrence of arthritis; but a patient who has once had gonorrhœal rheumatism is exceedingly likely to suffer from it with every subsequent attack of urethritis.

As already mentioned, any of the joints may be the seat of the disorder, but it often happens that two or three joints only are affected. Sometimes only a single joint suffers.

The order of frequency with which the different joints are attacked has been noted by various authors whose records have been collected and tabulated by Jullien.[4] Of 348 cases of arthritis, 135 were situate in the knee; 50 in the ankle; 34 in the wrist: 31 in the fingers and toes; 24 in the shoulder; 21 in the elbow; 18 in the hip; 10

[1] Rollet: Mal. Vén. 1865, p. 341, *et seq.*
[2] Dron: Lyon Médical. Juillet 15, 1877.
[3] Duplay et Brun: Arch. Gén. de Méd. Mai, 1881.
[4] Jullien: loc. cit., p. 222.

in the lower jaw. In the remaining 16, the joints of the foot, the sacro-iliac, sterno-clavicular, chondro-costal, or peroneo-tibial articulations were affected. In 205 of the 348 patients, more than one joint was attacked. In some few it was general, and in a still smaller proportion the affection was erratic. Nevertheless this tendency of the disorder to attack a large number of joints either simultaneously or successively is far more characteristic of simple than of gonorrhœal rheumatism. Although not mentioned in Jullien's statistics, the articulations of the spinal vertebræ may be most severely affected, and gradual ankylosis, with wasting of the muscles of the back, may follow. Such cases have come under our observation.

The time at which affections of the joints appear is very variable. Fournier[1] says most frequently between the sixth and the fifteenth day. Gosselin[2] finds their onset most usual from the fifteenth to the twentieth day, but gives a case in which the knee was affected a week after the appearance of the discharge. In many cases, however, several weeks and sometimes one or two months elapse before the joints are attacked.

The forms which gonorrhœal rheumatism assume are various, and have been arranged into the *hydrarthoses*, or those where the synovial membrane is distended with fluid; the *arthritic*, where the swelling is mainly due to thickening of the integuments and fibrous envelopes of the joints; the *arthralgic*, where the objective signs are very slight, pain being the chief symptom of the malady; and lastly, the *knotty* or *pseudo-gouty*, where the joints of the fingers and toes become thickened and deformed.

In the form of *hydrarthosis*, the symptoms are generally limited to one or at most two or three joints, and of these the knee is especially liable to suffer. Often both knees are attacked, or one knee and elbow or ankle. The affection begins insidiously. Premonitory symptoms of chills and heat are usually wanting, the first indication being the swelling and aching of the joint attacked, which latter sometimes becomes severe. The amount of effusion is often considerable, and the skin shines over the distended joint. The constitutional disturbance is seldom great, the local pain and swelling being the only important symptoms. The pain may be quite moderate in amount, and sometimes, according to Fournier, even entirely wanting. The swelling and pain continue often for several weeks, recovery being interrupted by repeated relapses before the affection subsides. These relapses are sometimes consequent on revival of the urethral inflammation.

[1] Fournier: loc. cit., p. 228.
[2] Gosselin: Gazette des Hôpitaux. 1877, no. 108.

The most usual termination is resolution, though suppuration, necrosis, and even fatal pyæmia have been noted. Ankylosis more or less complete, is also an occasional termination of this form of gonorrhœal rheumatism.

In the arthritic form, the symptoms may begin suddenly and with considerable constitutional disturbance. In some cases the affection begins with general malaise, and aching of the joint which gradually increases to severe pain. Duplay[1] has given an excellent description of this variety, for which he claims greater frequency than has hitherto been accorded to it. This form is more often seen in the elbow or wrist than in the knee, though no articulation would seem to be exempt. It is characterised by pain felt at the line of junction of the bones entering into the joint; this pain, generally considerable, may be magnified until it becomes agonising. There is also swelling of the coverings of the joint, most marked immediately over the line of junction, but extending also above and below the articulation. In a few days the swelling becomes doughy and suggestive of circumscribed superficial abscess or phlegmon, though no pus is really present, while effusion into the synovial capsule or sheaths of the tendons is either entirely wanting or very slight. Another and very distinctive sign is the crackling or grating that is heard or felt when the joint is exercised. *Ankylosis* is much more common in this than in the effusive form.

The presence of pain just at the line of junction of the bones, either spontaneous or provoked by pressure or movement, with the swelling at the same spot, and the crackling, distinguish this form of arthritis from any other variety.

In the form of rheumatism termed *arthralgia* the chief symptom is pain, attacking one or several joints successively, though being most severe and obstinate in one of the larger ones. This variety, occasionally an accompaniment of acute urethritis, is much more often attendant on chronic urethritis and old gleets. Its duration is uncertain, but almost always prolonged for several months by repetitions before it finally departs. Meanwhile the movements of the joints are not affected, nor are there any objective signs of morbid action in the articulation which is the seat of pain. From the joint the pain is also very prone to shift its locality to the fascia or to a large nerve.

The last variety of arthritis is that which forms thickening or projections about the articulations of the fingers and toes. Huguenard[2] has reported a characteristic example of this form. It is a rare

[1] Duplay et Brun: Archives Gén de Méd. 1881, p. 541.

[2] Huguenard: Rec. de Mém. de Méd. de Chirurg. et de Pharm. Militaires. 1879, p. 525.

variety, and is usually associated with effusion into the sheaths of the extensor tendons. The digits are more or less in a state of extension, and at the dorsal aspect of the articulation firm nodules form which impede the movement of the joint. The phalanx becomes swollen and somewhat doughy, especially around the heads of the metacarpal or phalangeal bones. The swelling is extremely painful and tender at first, but the pain soon subsides except during movement, though the swelling is extremely slow to disappear.

Besides the articulations of the limbs it has already been mentioned that any joint may suffer. Gosselin[1] has related a case of well-marked affection of the sacro-iliac joint, and Libermann[2] one where arthritis of the crico-arytænoid articulation was diagnosed in a gonorrhœal patient. In this patient the shoulder and knee were affected, and the laryngeal affection consisted of severe pain, complete aphonia, and swelling over the arytenoid cartilage. Well authenticated cases of the temporo-maxillary, sterno-clavicular, and costo-chondral joints are also on record; one of Duplay's cases of *arthritis* was that of a young woman in whom the sterno-clavicular joint was specially though not solely affected.

The fascia, that of the thigh or calf for example, and that of the palm or sole, especially near the heel, is occasionally the seat of prolonged pain, tenderness, and slight swelling.

Of the nerves, the sciatic is that in which gonorrhœal rheumatism has been most frequently observed. The form of sciatica to which it gives rise is most obstinate. In cases which have fallen under our observation the patients have not been free for several years from constant or very frequent attacks of pain along the course of the sciatic. In one case the affection has lasted five years, and now in the sixth year of its duration twinges are still felt if by any irregularity or excess an increase in the continual slight gleet is excited. Becchini[3] has reported two cases of sciatica which proved rebellious to treatment until the urethral discharge was cured.

The sheaths of the tendons and the bursæ are attacked very similarly to the joints. Serum is effused into them, causing distension and pain, which is increased by movement. The tendons most frequently affected are the extensors of the hand and fingers and the extensors of the toes on the front of the ankle and back of the foot. Those of the hamstring muscles, especially the biceps femoris, are also sometimes attacked. The bursæ most frequently affected are those

[1] Gosselin: Gaz. des Hôp. 1868. Dec. 12.
[2] Libermann: Bulletin de la Soc. médicale des Hôpitaux. 1873, tom. x. 2nde Sér. p. 388; and in Union Médicale. 1874. Nos. 151, 153.
[3] Becchini: Lo Sperimentale. 1879, p. 631.

beneath the tendo Achillis and behind the olecranon. The course of this affection resembles that of hydrarthrosis of the joints, except that it is apt to change its locality from one set of sheaths to another, or from the sheaths of tendons to the synovial membranes of joints. Mauriac[1] has published cases of this kind, and insists on the etiological importance of rheumatic or gouty predisposition. Maymou,[2] who has collected ten cases, is of opinion that these affections develope most frequently in persons of dartrous and not of rheumatic diathesis.

Diagnosis.—The disease with which gonorrhœal arthritis is most likely to be confounded is ordinary rheumatism. The resemblances are sometimes so close that a distinction cannot be drawn; indeed, in some cases the affection is probably simple rheumatism excited into activity by the gonorrhœal urethritis. But certain characters mark the majority of cases of gonorrhœal rheumatism. These are:—

1. The limited number of articulations in which the affection is active. For example, it is very rare for more than three or four joints to be simultaneously or even successively attacked, and certainly the general or universal implication of the joints which is not infrequently met with in acute rheumatism is never seen in the gonorrhœal variety.

2. Gonorrhœal rheumatism does not suddenly change its site from one joint to another in the way common in simple rheumatism.

3. This form is much more obstinate and prone to relapse than the simple one. As already stated, certain patients suffer from rheumatism with every fresh attack of urethritis. Moreover, the fluid effused in gonorrhœal arthritis is much slower of absorption than that of simple rheumatism.

4. The constitutional disturbance in gonorrhœal rheumatism is usually slight, while the temperature is commonly but little, and sometimes not at all raised.

5. In gonorrhœal rheumatism the sheaths of tendons, the fasciæ and the bursæ, are often affected in the same patient.

6. During the height of the affection the secretions are but slightly affected, the acid sweats, and high-coloured urine loaded with urates, are wanting, and though cardiac and pleuritic complications are not unknown, they are extremely rare in gonorrhœal rheumatism.

The termination of these gonorrhœal rheumatic affections is very similar for all. In most cases resolution; in a certain number permanent disfigurement by ankylosis of joints, or contraction and

[1] Mauriac: Des Synovites tendineuses symptomatiques de la Syphilis et de la Blennorrhagie. Gaz. des Hôp. 1875, pp. 274 and 297; translated by Cadell. Edin. Med. Jour. Sept. and Nov. 1875.

[2] Maymou: Archives Gén. de Méd. 1875, [illegible] 555 et 653.

fixation of the fasciæ and tendons. In rare cases more destructive consequences ensue: suppuration in the joint, necrosis of the bones, even septic absorption and death.

The duration varies much—in most cases it is tedious, five or six weeks being a common term; while the patient may be harassed for years by relapses of the disease.

The prognosis is thus most uncertain with regard to the length of time during which the affection may last; but in most cases, under careful treatment, complete resolution may be expected ultimately.

Treatment.—In treating this obstinate affection, much benefit can be afforded by attention to two points. The first is not to lose sight of the original cause, the urethritis, and to cure that as speedily as possible; for, though the cessation of the urethritis does not always produce cessation of the rheumatism, it causes considerable alleviation in a large proportion of cases. To this end treatment should be vigorously carried out according to the directions given in the preceding chapter, specific medicines or injections or both being employed, according to the nature of the discharge and the stage of the disease. The next point is to apply the remedies useful for the treatment of an inflamed joint. For instance, an acute arthritis needs rest, in splints. Duplay lays great stress on the necessity for complete fixation of the joint in cases of the *arthritic* form; and in all cases where the pain is at all severe, fixation by light splints and a plaster of Paris bandage greatly reduces the pain and shortens the duration of the affection. To fixation may be added the application of belladonna extract and glycerine, leeches and warm fomentation. Blisters also are of great service, especially when there is much effusion. The general condition of the patient should always receive careful attention, and though the remedies usually beneficial in ordinary rheumatism have in many cases but little effect, alkalies with sedatives, colchicum, iodide of potassium, and quinine, are all sometimes very useful. A mercurial purge should also be administered from time to time. Salicylate of soda has been tried, with varying results. Keyes[1] states that he has given it in several cases, pushing it rapidly until some disturbance of the cerebral or digestive organs was produced, and then reducing the dose; he also states that, though it may fail absolutely, he has had every reason to be satisfied with the result, which is sometimes unexpectedly prompt. Gamberini,[2] on the other hand, has found salicylate of soda totally useless. The diet must be moderate, alcoholic fluids being withheld, and fish, farinaceous food, and fresh fruits substituted for butcher's meat. When the affection has become chronic,

[1] Keyes: The Venereal Diseases. 1880, p. 337.
[2] Gamberini: Giornale Ital. delle Mal. Ven. e della pelle. Agosto, 1879.

a course of warm sulphur baths at Bath, Aix, Buxton or Droitwich is most useful; to the baths may be also added shampooing or rubbing of the affected joint. The administration of cod-liver oil, and the iodide or some other preparation of iron is also very beneficial in the later stages of the malady.

Rheumatoid Ophthalmia.—In connection with gonorrhœal rheumatism certain affections of the eye, similar to those caused by other forms of arthritis, are liable to occur. Fournier[1] has collected a large number of cases of rheumatoid ophthalmia. In nearly all of them the joints were attacked as well as the eye, but in a small number of cases the joints escaped. Generally several joints and synovial sacs were affected when the eye was also inflamed, and not infrequently the pain and congestion passed from the eye to the joints, and *vice versâ*. In some of the cases the ophthalmia preceded the arthritis. Again, a patient suffering from several attacks of gonorrhœa may have the eye inflamed in one attack, and in another, swelling of some of the joints. Fournier records a case where a man had four attacks of gonorrhœa in five years: with the first attack he had double ophthalmia, and no articular rheumatism; with the second, first the eyes and then the joints suffered; with the third, first the joints and then the eyes; with the fourth attack he had articular rheumatism only.

The part of the eye chiefly attacked is the iris; indeed, in most cases the affection closely resembles ordinary rheumatic iritis, but in some instances the conjunctiva and sclerotic become inflamed without iritis being also present. In this form of iritis, according to Nettleship,[2] the first attack is more frequently symmetrical than when it arises from other forms of arthritis; but it is more usual for one eye to become inflamed before the other is affected, and the disorder may attack them alternately, one eye being better the other worse, for some time before the inflammation ceases.

Symptoms.—When the iris is unaffected the symptoms resemble those of common conjunctivitis, but the discharge is usually only watery, not muco-purulent. In iritis there is pain in the eye and around the orbit, with lacrimation, intolerance of light, and dimness of vision. There is also ciliary congestion, and the iris becomes more or less cloudy and loses its polish. The pupil is usually sluggish or fixed, and often contracted or irregular.

The prognosis is usually favourable; but the iritis shows the same tendency to relapse, and to the formation of adhesions, as does ordinary rheumatic iritis.

[1] Fournier: Nouveau Dict. de Méd. et de Chir. prat. p. 249. See also Rollet: Maladies Vénériennes. 1865.

[2] Nettleship: Diseases of the Eye. 1879, p. 343.

Treatment.—The eye should be protected from the light, and a solution of sulphate of atropine (F. 80) used every hour or every two hours until the pupil is fully dilated. Afterwards a weaker solution (F. 81) may be employed. If there is much pain, leeches should be applied to the temple. General treatment of the joint affection must of course be carried out at the same time.

The Heart occasionally suffers during gonorrhœa, nearly always in connection with affections of the joints; but cases are on record in which there was no joint affection. Ricord alludes to cardiac complications; and two cases were reported by Brandes[1] of Copenhagen in 1854. Since then others have been recorded by Desnos,[2] Lacassagne,[3] Marty,[4] and Baudin.[5] Morel[6] has collected thirteen cases,—two of pericarditis (Brandes, Lacassagne), and eleven of endocarditis. All the valves of the left side of the heart have been found affected, but the aortic most frequently. The cardiac affection is usually mild in character, the symptoms being slight, and thus liable to be overlooked. One case however (Lorain[7]) terminated fatally. Gonorrhœal rheumatism is generally present, but in some cases—those of Marty and Baudin for example—there was no joint affection. In five cases the joints had never been affected before the patient contracted gonorrhœa. In five the antecedents of the patients are not mentioned. Three only are reported to have had rheumatism previous to the urethritis. Of the thirteen patients, all of whom were males, the youngest was 23 and the oldest 50 years of age.

Marty's patient was a young man aged 22, who had no heart disease previously. Nor was there any history of rheumatism, either in himself or his parents. The patient was admitted into the Val de Grace hospital, under M. Poncet, with gonorrhœa, on August 17, 1876. Symptoms of endocarditis with a bruit at the base of the heart appeared between 5 and 6 weeks afterwards. The man was convales cent by the end of October, but the bruit was still audible. There was no joint affection throughout. In Baudin's case the patient was a soldier aged 25, in whom there was no personal or family history of rheumatism, and who had always had good health. The man had been suffering from gonorrhœa (his first attack) for ten weeks, and had been treating himself up to the time of his admission into the military hospital. He was then suffering from headache, fever, and shivering, which symptoms were thought to be due to malaria.

[1] Brandes: Archives Générales de Médecine. 1854, Sept., p. 257.
[2] Desnos: Progrès Medical. 12 Dec. 1864.
[3] Lacassagne: Archives Gén. de Méd. 1872, Jan., p. 15.
[4] Marty: Archives Gén. de Méd. Dec., 1876.
[5] Baudin: Recueil de Mém. de Méd. de Chirurg. et de Pharm. Militaires. 1879, p. 530
[6] Morel: Thèse de Paris. 1878.
[7] Lorain: quoted by Marty, loc. cit., from Tixier's Thèse. 1866.

Quinine was prescribed, but the patient got worse, the temperature rose to 104°, the pulse became intermittent, and palpitation was complained of. These symptoms drew attention to the heart. The cardiac dulness was increased, but there was no bulging, and the heart sounds were louder than usual. A distinct murmur which involved the end of the first sound and the whole of the second was heard at the base. Endocarditis was diagnosed. Opium was given internally, and mustard poultices were applied over the heart. The patient became convalescent in seventeen days, the pulse having then become almost regular; but a faint diastolic bruit was still audible. The urethral discharge slightly increased as the patient recovered. The further history of the case is not related. Baudin remarks on the late stage at which the heart affection occurred in this case (during the tenth week). In the other recorded cases the heart became affected about the fourth week of the discharge.

GONORRHŒA.

CHAPTER V.

VAGINITIS.

GONORRHŒA in woman consists of contagious purulent inflammation of the vaginal mucous membrane and its continuations, with certain occasional complications of more distant regions. The disorder begins at the lower part of the vagina, but rarely remains limited to that locality. The inflammation usually invades also the vulva, the upper part of the vagina, and the cervical portion of the uterus; it also frequently extends to the urethra, and sometimes to the bladder, or to the interior of the uterus, the Fallopian tubes, and the peritoneum.

Though contagion with the discharge from urethritis in the male is the prevailing cause of acute vaginitis, it may arise from many other causes. Violent and repeated sexual intercourse, especially when indulged in about the menstrual period, often causes inflammation of the mucous membrane. Vaginitis is also sometimes caused by criminal assaults, and it may occur in newly-married women. The presence of foreign bodies, such as a sponge, or pessary, and strong injections, will excite vaginitis, but inflammation thus engendered subsides readily when the cause is removed; the acute vaginitis of contagion is more violent, and more prone to become chronic. Acute vaginitis, again, sometimes arises in the course of measles, small-pox, and other acute diseases, or after exposure to damp and cold. Chronic vaginal catarrh may be produced by chlorosis, by congestion of the hæmorrhoidal and uterine vessels, and other conditions in weakly women.

The inflammation of the vagina produced by the gonorrhœal discharge is not *clinically* different from that caused by any other irritant; hence the symptoms are merely those of vaginitis, at first in an acute form, and afterwards becoming chronic before it ceases altogether.

Symptoms.—A few days after coitus, a tickling sensation, soon changing to heat and burning, is felt in the external genitals. The mucous membrane grows dry, bright red, and tender; the labia swell, and cause discomfort or pain in walking and sitting down; scalding with micturition is usual. The swelling often becomes considerable by extension of the œdema throughout the external genitals. Dull aching pain in the sacral region, and in the limbs or body generally, is not infrequent when the attack is severe. The discharge is at first thin, watery, and small in quantity; but it soon grows whitish yellow, or even greenish in colour, of an offensive odour, and so profuse that it flows away copiously when the vagina is opened by the finger. The vaginal papillæ also are often prominent and distinct. At a later period, when a speculum can be introduced, the mucous membrane of the whole vagina, and often that of the vaginal portion of the uterus, is seen to be bright red, while around the os tincæ it may be raised into a group of papillæ, which gives the cervix a strawberry-like appearance. The cul de sac behind the neck of the uterus is generally filled with thick yellow matter, and the epithelium of the whole of the vagina is easily abraded, so that it bleeds if any roughness is employed in using the speculum. When the inflammation is very intense, the constitution participates in the disturbance; and loss of appetite, thirst, hot skin, pains in the limbs and restlessness, with other signs of fever, may be present.

When the acute congestion and copious discharge have continued for about a week, the irritation subsides, the external swelling and tenderness diminish, the vaginal discharge becomes whiter, the mucous membrane assumes a somewhat livid hue and is very lax; here and there, patches of it are excoriated. If the patient avoids fresh irritation and conforms strictly to the necessary regimen, the discharge gradually gets less in quantity and more like the natural secretion, and the parts return to their ordinary condition in three or four weeks. But this termination is often missed; and the inflammation before it ceases, extends to the urethra, or neck of the uterus; or it may still hang about the upper part of the vagina, when it has ceased near the entry. The glands of the groin often swell and grow tender while the vaginitis is at its height; this irritation may even proceed to abscess, which is simply sympathetic and never virulent. This complication, however, is more frequently dependent on vulvitis than on vaginitis.

Granular vaginitis was at one time supposed to be peculiar and distinct from ordinary vaginitis, but it is probably only the result of the congestion of the mucous membrane being greater in certain parts than in others. It is best marked in pregnant women. In this condition the mucous membrane is dark purplish in patches, and

dotted with little granular elevations of a darker hue than the surface they spring from.

The discharge in the chronic stages is generally whitish, milky, even creamy; it consists of pavement epithelium, pus, and mucus corpuscles, and very often infusoria are present; one of these, the trichonomas, was at one time supposed to distinguish gonorrhœal from simple vaginitis, but Scanzoni and others have detected it in every form of abnormal vaginal discharge though not in healthy mucus.

The *diagnosis* of vaginitis from other disorders is seldom a difficult matter. The bright red mucous membrane which secretes serous pus, or thick matter, and is tender and bleeds if chafed, distinguishes acute vaginitis. The mere presence of pus in the vagina is not sufficient to diagnose vaginitis, as the matter may come from an abscess in the wall of the vagina, or from the uterus; but the speculum shows at once if the discharge come from such a source.

It may be impossible to say, when the vaginitis has no complication, whether it arises from contagion or from other causes; nor is the infectious nature of the secretion peculiar to gonorrhœal vaginitis, for it is tolerably certain that the purulent discharge of any acute vaginal inflammation is more or less contagious. The co-existence of urethritis with vaginitis is strongly suggestive of gonorrhœal origin, for this complication rarely follows any vaginal inflammation except that produced by contagion.

Another question to be decided is, the power of a particular discharge to communicate urethritis to the male. This is often extremely difficult to settle; sometimes the discharge becomes apparently mere mucus, yet retains the infectious quality very strongly. Again, the greater part of the vagina may have recovered its natural condition, while a certain small area—the cul de sac behind the neck of the uterus, for instance—still secretes a contagious discharge. Guérin believes that the urethra, and some of the ducts of the glands in the vulva, may continue inflamed long after gonorrhœa, and that if the genital organs are irritated or unusually excited, these small foci may secrete matter in sufficient quantity to propagate the disease afresh.

Gonorrhœal vaginitis is characterised by the acuteness and severity of its symptoms; the pus is early and copious in formation, and the vulva rarely escapes. The inguinal glands are likely to suffer, and extension to the uterus and ovary is more common in gonorrhœal than in other forms of vaginitis. The diagnosis between gonorrhœal and simple vaginitis depends on the presence or absence of some of these complications, and cannot in all cases, even with this assistance, be made certain; but the greater the number

of complications present, the greater becomes the probability of the gonorrhœal nature of the discharge.

The *prognosis* of vaginitis is very favourable when it is not neglected, and does not extend to the urethra or uterus. If, on the contrary, it reaches the urethra, it causes obstinate urethritis; and when the uterus is also inflamed, the disease is more difficult to treat, and the suffering of the patient is greatly increased, while there is some risk of pelvic peritonitis, though this result of gonorrhœa is comparatively rare.

Treatment.—Attempts to cut short the inflammation at the beginning by any kind of abortive treatment are seldom of any avail. While the swelling and irritation continue, the patient must rest in bed, and take a warm bath twice daily. It is best, when practicable, to immerse the whole body, not merely the hips, that the blood may not be attracted to the pelvic organs. Pieces of rag wetted with warm lead lotion, should be laid between the labia to separate the inflamed surfaces from each other. During the acute stage, saline purges are necessary; and moderate doses of tartarated soda, sulphate and carbonate of magnesia, or sulphate of soda, are useful to promote free secretion from the mucous membrane of the intestines, and thereby relieve the congestion of the genital organs. The diet must be very simple, and all stimulants avoided. The patient may drink freely of barley-water, linseed-tea, or other diluent, to allay the thirst and dilute the urine.

As soon as the introduction of a syringe can be borne the vagina should be cleared three times a day with injections of tepid water, followed by a weak solution of acetate of lead or of borax (F. 15, 16). In using a vaginal injection it is essential that an apparatus capable of carrying the injection well up to the os uteri be employed. Patients should always receive special directions on this point, for the small glass and metal syringes they are in the habit of using are completely useless for the purpose. Perhaps the most generally useful syringe is the ordinary Higginson's enema apparatus, fitted with a tube six inches long and perforated with small holes arranged so that the fluid is directed backwards. But more efficient in thoroughly cleansing the vagina and less troublesome for the patient, is irrigation by means of a column of water brought from an elevation of three or four feet above the patient by means of india-rubber tubing. When using any of these appliances the patient should lie down with the hips raised and brought close to the edge of the bed, an india-rubber sheet being arranged so that the fluid flows away into a vessel placed on the floor; or a bed pan may be used. If this cannot be managed the patient may sit in a bath. The tube should be passed along the posterior wall of the vagina and a stream

of warm water kept flowing for ten minutes or a quarter of an hour, after which any medicated solution that may be necessary is injected.

When the irritation lessens, astringent injections (F. 17 to 19) should be employed, beginning with a weak solution and gradually increasing the strength. These injections should be used twice or thrice daily after the vagina has been thoroughly cleared in the manner just described. All injections should at first be tepid, but in chronic cases the astringent fluids may be used cold. Sulphate of zinc and alum are the most useful drugs for this purpose; but common rough claret diluted with three or four parts of water forms a very efficient injection in some cases. Tannin is also an excellent astringent, but it has the disadvantage of staining the linen indelibly. Nitrate of silver also stains, and has no advantage over other astringents.

The chronic course of the discharge must be combated more actively, and local treatment should be directed to the part that is diseased. The first necessity is great cleanliness; hence, injections should be used regularly. Pledgets of cotton-wool, containing powdered alum or tannin, may also be introduced into the vagina through a speculum, and are very effectual in checking the discharge. The best method of preparing these pledgets or *tampons* is to take a thin layer of cotton-wool, about the size of the palm; place on it thirty grains of alum or tannin, and catch together the edges with a piece of thread wound round them; the end of the thread should be left about twelve inches long, that it may be easily caught hold of when the wool has to be withdrawn. The plug is pushed well up to the cervix uteri, before the speculum is withdrawn. The powder gradually dissolves in the mucus, keeping the parts constantly bathed with a strong astringent solution for forty-eight or seventy-two hours until the alum or tannin is all dissolved. A fresh plug should be passed every third day; and while it is retained, syringing with warm water should be continued night and morning. The patient must be cautioned that after the cotton-wool is withdrawn, the injection will bring away shreds of inspissated mucus that may be mistaken for pieces of skin, and cause her much alarm. This method of applying astringents is the one we have found most successful in treating chronic vaginal discharges among the out-patients of the Lock Hospital, whose neglect of their instructions, and irregular attendance, very greatly impede every plan of treatment which may be tried. Instruments have been contrived for the introduction of the astringent powders without previously enveloping them in wool, but they are not necessary. When the discharge is very profuse, tannic acid and oxide of zinc are better than alum. Other preparations may be introduced into the vagina in the same way; the carbolic acid and

glycerine of the Pharmacopœia, or tincture of iodine, can be suspended on cotton-wool, and passed up to the os uteri through the speculum; carbolic acid is most useful when there is erosion, and iodine when the cervix is enlarged. Sometimes an obstinate discharge from the vagina can be cured by using a strong solution of nitrate of silver. The speculum should be passed, and the vagina well cleared with an injection of water; then about an ounce of distilled water, containing a drachm of nitrate of silver, is poured into the speculum, and the solution made to bathe every part of the vagina by slowly withdrawing the speculum. Besides this, the vagina should be regularly injected night and morning with water, and the solution of nitrate of silver repeated every four or five days. Three or four applications are generally sufficient to cure the discharge.

Constitutional treatment.— The specifics which are so useful in checking chronic urethral discharge in men have no influence over vaginitis, though they are beneficial when the inflammation has extended to the urethra. Thus, the general treatment consists in improving the bodily health, in regulating the action of the bowels and in removing any anæmia that may be present. While the local applications are being regularly used, the patient should take a scruple of sulphate of magnesia with one or two grains of sulphate of iron and a little tincture of calumba in water two or three times a day, or some other preparation of iron if this disagree with the stomach. Women suffering from gonorrhœa should not permit intercourse while any discharge remains, both because a very small remnant of congestion is easily excited to general inflammation, and because so long as discharge exists there is danger of contagion. The treatment of the consequences of vaginitis is described along with each complication, which have now to be taken into consideration.

GONORRHŒA.

CHAPTER VI.

COMPLICATIONS OF VAGINITIS.

Vulvitis.—The earliest and most constant complication of vaginitis is inflammation of the external organs of generation; this is called *vulvitis*. The causes are irritation of all kinds. Neglect of cleanliness, especially if the patent is fat and the weather warm, will cause inflammation without any gonorrhœal contagion. Vulvitis also sometimes occurs during the course of certain acute diseases—small-pox and measles for example. The irritation due to ascarides is also said to be a cause. Criminal attacks, masturbation, neglect of cleanliness, exposure to cold and damp may also excite inflammation, especially in unhealthy children, in whom also a form of sloughing vulvitis sometimes becomes epidemic without known cause. Gonorrhœa, however, is the most frequent cause of vulvitis, either by the inflammation extending from the vagina to the vulva, or less frequently by the disorder beginning there and spreading to the vagina.

The symptoms begin with itching, smarting, redness, and swelling of the large and small labia, from which the redness generally extends to the skin of the perinæum and thighs. The secretion of the sebaceous glands is greatly increased, and often collects in thick adherent layers in the folds of the mucous membrane. An offensive muco-purulent discharge drains from the vulva, and frequently causes erythema, erosions, and inflammation of the hair follicles. If this secretion is wiped off, the glandulæ project as small round yellowish eminences on the red surface. While the parts are swollen, walking and even sitting upright are very painful. Vulvitis usually subsides readily if the patient allay the irritation by rest and local application. If neglected, however, and at times even in spite of treatment, the inflammation spreads along the duct of Bartholine's gland, and besides remaining a source of contagion that is liable to be overlooked, is very likely to cause suppuration of the

gland itself (see p. 608). When the irritation is great, or the patient weakly, the inflammation sometimes becomes erysipelatous, and may then cause abscess and sloughing of the labia and parts adjacent. Vulvitis also occasionally excites sympathetic irritation of the inguinal lymphatic glands.

In the *diagnosis* of gonorrhœal from simple vulvitis, Tardieu[1] attaches most importance to a state of extreme turgescence of the blood vessels at the entry of the vulva and vagina; the presence of urethritis; the acuteness of the inflammation; and the violence and purulence of the discharge. It must be admitted however that a positive opinion cannot be given in a large number of cases. The question of criminal assault also sometimes arises in connection with vulvitis in children, and is a most important one. Fournier[2] has carefully considered this question, and gives an account of an interesting case in which a false charge was made of a criminal assault on a girl eight years old. In this case a violent vulvitis had been produced by rubbing the genital organs with a blacking brush. In another case vulvitis had been produced by friction with a rough and dirty towel. Masturbation also may produce vulvitis in every way similar to that produced by a criminal assault. Thus, violent irritation of any kind may produce vulvitis, especially in children, which cannot be distinguished from that produced by venereal causes.

Treatment.—The patient must rest, bathe frequently, and wash off the secretion with an alkaline lotion of carbonate of soda to dissolve the fatty secretion. The inflamed surfaces must be separated by layers of rag, either dry or dipped in weak lead lotion. During the first few days, warm fomentations or bread and water poultices may be applied. In the later stages the surfaces should be kept very clean, dried after each washing, and dusted with powdered oxide of zinc.

Urethritis.—This is a frequent complication of gonorrhœal vaginitis. One-fifth of Cullerier's patients suffering from acute discharge at the Lourcine Hospital had urethritis. It may arise also, according to some authorities, by direct contagion without being preceded by vaginitis. While admitting the possibility of this occurrence, we have however never seen urethritis apart from vaginitis, past or present. Urethritis in women is extremely rare as a simple disorder. Guérin,[3] Cullerier,[4] and others believe that it is always the result of contagion. Most authors, however, though allowing that urethritis is extremely strong evidence in favour of contagion, do not go so far as to deny its occurrence from other causes. West[5] and Matthews

[1] Tardieu: Étude Medico-legale sur les Attentats aux Mœurs. 6th edit. 1873, p. 78.
[2] Fournier: Bulletin de l'Académie de Médecine. 1880, no. 43, p. 1090.
[3] Guérin: Malades des organes génitaux externes de la femme. 1864, p. 300.
[4] Cullerier: Précis Iconographique des Mal. Vén. 1866, p. 170.
[5] West: Diseases of Women. 4th edit., 1879, p. 610.

Duncan,[1] for example, recognize the existence of urethritis quite independent of venereal contagion.

The symptoms vary much, according to the intensity of the neighbouring inflammation of the vagina or vulva. When the urethritis is very acute, the patient complains of smarting, straining, and frequent desire to make water, but unless this is the case she generally does not complain of more than a little itching at the meatus. The mucous membrane is red and swollen round the meatus, the redness being often punctiform, and the papilla between the meatus urinarius and the vagina is thrust prominently forward. There is generally a whitish muco-purulent or purulent discharge oozing from the meatus, though when the inflammation has become chronic it often needs some trouble to make the existence of the discharge evident. To do this the meatus should be wiped, and the finger passed into the vagina and pressed along the urethra while being slowly withdrawn. This manœuvre will generally bring a drop of pus to the orifice. When the patient has recently passed water the urethra may be quite clear of discharge. In such cases the ducts of the follicles which open at the surface close to the meatus urinarius will exude matter. Guérin maintains that the discharge from these ducts is capable of exciting gonorrhœa when every other source of contagion is exhausted. Urethritis, if neglected, may continue in the chronic stage for an indefinite length of time before it subsides; and if it have originated in contagion, it will be impossible to say when it has ceased to be dangerous and unable to excite gonorrhœa in others.

In *treating* this obstinate disorder only simple means are requisite in the acute stage; diluent drinks, warm baths, and tepid lotions. When, as often happens, the discharge is not discovered till the inflammation has become chronic, the most useful remedies are soluble bougies of cocoa butter containing tannin, alum, sulphate of zinc, or subacetate of lead. A strong solution of nitrate of silver (F. 78) may be applied to the interior of the urethra when the discharge resists the previous remedies. This application should be repeated every three days for a few times until the secretion is considerably increased. After this, if injections of water only are used, the discharge generally subsides in a short time. A long pencil of nitrate of silver may in very obstinate cases be introduced into the urethra. After this cauterisation the patient should take a warm bath, and repeat it every day for a few days. There is far less danger in applying caustic applications to the interior of the urethra in women than in men, and they may generally be used without fear. When the discharge is furnished by the ducts of the

[1] Matthews Duncan: Med. Times and Gazette. June 26, 1880.

follicles opening near the meatus urinarius, a fine probe coated with nitrate of silver should be thrust along them, or some caustic solution injected with a very fine pointed syringe. Besides the local treatment specific drugs such as copaiba, cubebs or sandal-wood oil may also be administered with advantage.

Cystitis occurs in women from extension of the urethral inflammation, and though less commonly seen than in men, is not so rare as it is generally supposed to be. Probably it is not infrequently overlooked, for the symptoms are often much less acute than in the other sex. Frequency of micturition, tenesmus, pus and sometimes blood in the urine, are the leading signs. The treatment consists in the frequent employment of warm baths, fomentations with poppy water, rest in bed, and the administration of sedatives and alkalies.

Further extension along the urinary tract is extremely rare. Murchison,[1] however, has recorded the case of a woman, aged 25, who was admitted into the London Fever Hospital in an unconscious state, and who died two days afterwards. At the post-mortem examination both kidneys were found to be in an early stage of acute *nephritis*—large, smooth, and almost black from intense congestion. The ureters and pelves of the kidneys were full of thick yellow pus. The bladder also contained pus. The lining membrane of the vagina, urethra, bladder, ureters, and pelves of the kidneys was intensely red. These morbid changes were considered by Murchison to be due to gonorrhœa.

Gonorrhœal Rheumatism is less frequent in women than in men, probably because the urethra is not always involved in the former. Most authors[2] are of opinion that arthritis never arises without urethritis, though some believe in its occurrence from genital irritation of various kinds[3]—dysmenorrhœa and ovarian troubles, for example—the consideration of which would be out of place in the present work. Gonorrhœal arthritis has already been described among the complications of urethritis in man, to which the reader is referred for further information.

Affections of the Uterus.—*Inflammation of the vaginal portion of the womb* is most commonly produced by extension from the vagina; but according to Rollet[4] the vaginal portion is sometimes affected primarily, by direct contact with matter from the male urethra during coitus. With Rollet certain other authors agree—Rémy[5] quotes a case of Hardy's of this kind: probably the affection does

[1] Murchison: Clinical Transactions. 1876, p. 25.
[2] See Cullerier, loc. cit., p. 174, and Matthews Duncan, loc. cit.
[3] Ord: Brit. Med. Jour. Jan. 31, 1880.
[4] Rollet: Annales de Derm. et de Syph. 1869, tom. i., p. 100.
[5] Rémy: Metrite Blennorrhagique, Gaz. Méd. de Paris. 1879, Janvier, Février, Mars.

sometimes commence in this manner, but we have never seen such a case ourselves. In such rare instances, this inflammation would of course be the starting point of the gonorrhœa. In the vast majority of patients, however, the affection, being a consequence of vaginitis, does not appear until three or four weeks after the appearance of the vaginal inflammation.

The cervix swells and its surface grows red and bleeds easily if chafed by the speculum; around the os tincæ it is dotted with small yellow vesicles which soon coalesce and then form shallow erosions which secrete pus freely and bleed readily. In the course of a week or two the redness and swelling subside or pass into a chronic condition. The erosions and granulations of the cervix which then develope have nothing in themselves peculiar, and will be described in the chapter on Accessory Venereal Disorders.

Acute Endometritis.—When the inflammation extends to the interior of the uterus, it may remain limited to the cervical portion, or may spread to the body of the uterus as well.

The Symptoms are pain in the back, loins, and thighs; dragging and sense of weight in the pelvis, often accompanied by vesical and rectal tenesmus. With these also there may be a greater or less amount of constitutional disturbance, and in severe cases pain and tenderness on pressure over the lower part of the abdomen. On examination by the finger the cervix is found to be swollen and very sensitive, the body of the uterus somewhat enlarged, and the whole organ lower down in the pelvis than in the normal state.

In four or five days a viscid discharge appears, and in about a week or ten days becomes purulent and sometimes mixed with blood. The secretion of the cervical canal is at first clear and viscid, resembling thick starch, but when mixed with that from the body of the uterus, it assumes a creamy appearance. The discharge from both portions is alkaline, that of the vaginal mucous membrane being acid. The uterine discharge is extremely acrid, and may set up vaginitis if that be not already present. The discharge also often produces irritation and excoriation of the external organs. Through the speculum the cervix is seen to be red and swollen, while a clear viscid or muco-purulent discharge flows from the os.

When the interior of the body of the uterus is inflamed, the uterine tissue is probably always more or less affected as well (metritis). The affection generally lasts three or four weeks, and may end in recovery or pass into the chronic form of endometritis or leucorrhœa, which will be considered among the Accessory Venereal Disorders.

Diagnosis.—Though there is no peculiarity about inflammation of the cervix uteri when originating in gonorrhœal vaginitis that

distinguishes it from inflammation through other causes, there can be no doubt that a uterine discharge is frequently the cause of gonorrhœa in men, and the more so because in its chronic form it often escapes the patient's attention altogether. If she is aware of the existence of a discharge, she is usually very anxious to know whether it is contagious; a question that is often very difficult to answer. But it may be concluded that the discharge in all probability arises from contagion, if there has recently been vaginitis, and if any discharge can be obtained from the urethra. But when there is no urethral discharge and no vaginitis, and if the inflammation set in during or shortly after the menstrual period, or if the patient has been exposed to cold, fatigue, or is newly married, the disorder has probably arisen independently of gonorrhœal contagion.

The treatment consists in perfect rest in bed and the administration of opium in sufficiently frequent doses to keep the patient free from pain. The diet must be limited to slops, such as milk and beef tea. Warm poultices or fomentations should be applied to the abdomen and changed as often as may be necessary. When the discharge appears the vagina must be cleansed by means of warm water injections. Thomas[1] recommends that a stream of water as warm as the patient can bear should be directed against the cervix for a quarter of an hour, three times a day, and that this should be continued until recovery takes place or until the disease passes into the chronic form. In some cases of acute endometritis if congestion be very great the application of six or eight leeches to the cervix may be beneficial, but they are rarely necessary.

Pelvic Peritonitis and Ovaritis.—When the inflammation spreads beyond the body of the uterus along the Fallopian tubes to the peritoneum a severe form of pelvic peritonitis is produced. In such cases the ovary is probably always more or less affected, and as ovaritis apart from pelvic peritonitis probably does not occur, at any rate from gonorrhœa, we shall consider the two affections together. As, however, these diseases when set up by gonorrhœa do not differ in their symptoms and treatment from inflammation depending on other causes, we shall only briefly describe the leading features connected with them, referring the reader to works on Diseases of Women for a more complete description.

Gonorrhœa would appear to be a tolerably frequent excitant of pelvic peritonitis. Bernutz and Goupil,[2] who were the first to give a clear description of the disease, found this form of pelvic inflammation occur twenty-eight times among ninety-three women admitted into the Lourcine Hospital for gonorrhœa in sixteen months. Since that time

[1] Gaillard Thomas: Diseases of Women. 5th edit. 1881, p. 274.
[2] Bernutz and Goupil: Diseases of Women, Syd. Soc. Transl. 1867. Vol. ii., p. 57.

Matthews Duncan[1] and others have also drawn attention to its occurrence. Thomas[2] remarks that gonorrhœa is a fruitful source of pelvic peritonitis, and that he has seen a number of severe cases due to it.

The time after the first appearance of vaginitis at which the pelvic inflammation begins is most commonly about a month. It was observed by Bernutz and Goupil only twice at periods longer than a month, and never before eight days had elapsed from the commencement of the gonorrhœa.

The results of these inflammatory affections are often serious beyond the immediate pain and distress that attend them. Adhesions of the ovary and tubes to the uterus, causing dysmenorrhœa, menorrhagia and sterility, are not uncommon. Even general peritonitis or pelvic abscess and fatal septicæmia are not unknown. In a case reported by Mercier,[3] where a girl aged nineteen died with typhoid symptoms during the course of gonorrhœa, the cavity of the cervix was found post mortem to be deep red. The uterine tissue was not inflamed, but the mucous membrane of its interior had the colour of wine lees. The inflammation was continued into the Fallopian tubes, and the cavity of all these parts contained abundant puriform mucus. There was peritonitis extending to the culs de sac between the bladder and uterus, and uterus and rectum, and to the surface of the uterus, ovaries and tubes; over the latter of which recent adhesions had formed.

Martineau[4] insists that many of these cases of pelvic inflammation are really cases of inflammation of the pelvic lymphatic vessels and glands. He maintains that the tender tracts or patches which may be felt by the finger through the vaginal walls are produced by the inflammation of the lymphatic vessels and glands connected with the upper portion of the vagina. From this site the inflammation may extend *to the serous covering of the generative organs* or to the periuterine and pelvic cellular tissue, setting up inflammation or abscess there, while the ovaries and Fallopian tubes are not themselves necessarily inflamed. The affection is therefore, in Martineau's opinion, adenitis consequent on vaginitis, and not an inflammation by continuous extension along the uterus to its annexes.

The symptoms of pelvic peritonitis are those of general peritonitis, but in a more limited form. They consist in great pain and tenderness over the lower part of the abdomen, accompanied by distension, high temperature, thirst and general constitutional disturbance.

[1] Matthews Duncan: Perimetritis and Parametritis. 1869, p. 84.
[2] Gaillard Thomas: loc. cit., p. 491.
[3] Mercier: Gazette des Hôpitaux. 1846. Quoted by Rémy: loc. cit.
[4] Martineau: Traité Chir. des affections de l'uterus, &c. 2nde partie. 1879, p. 426.

On examination, the whole vagina will be found to be hot and sensitive, and the roof of that canal soon becomes hard to the touch. The symptoms of acute ovaritis are included in those of the peritoneal inflammation. In chronic ovaritis the symptoms are often vague and indefinite. The patient complains of pains in the back and groins, and, if the ovary be prolapsed, of pain during sexual intercourse. Menstrual troubles soon follow. On examination the ovary can be felt as a very tender swelling on one or other side of the uterus or behind it.

Treatment.— Absolute rest, simple diet, warm baths, and opiates are requisite in the acute stages. Warm poultices and fomentations to the abdomen and tepid injections into the vagina to clear away the discharge are most serviceable. The application of leeches just above the groin often gives relief, while belladonna and opium suppositories may be added to the general sedative treatment if necessary.

If, through cellulitis being set up, a fluctuating swelling be felt through the vaginal wall, and its production have been preceded by shivers, high temperature, and other indications of suppuration, the abscess should be punctured through the vagina, and the cavity kept empty with a drainage tube, until it has contracted.

In the chronic forms of the affection, especially of chronic ovaritis, local counter irritation by repeated blisters above the groin, careful regulation of the general health, and abstention from sexual intercourse near the menstrual periods, are most essential. Bromide or iodide of potassium may also be administered. Some authors recommend that the displaced ovary should be supported by a pessary. To cure the recurrent hæmorrhage met with in some cases, and the constant or intermittent pain which is sometimes so severe as to render life a burden, spaying has been practised; but this last resource is not yet generally accepted by the profession.

GONORRHŒA.

CHAPTER VII.

EXTRA-GENITAL GONORRHŒAL AFFECTIONS.

Gonorrhœal Ophthalmia.—This is a most violent and destructive form of purulent inflammation, and is produced only by direct contact of the pus with the conjunctiva. It often destroys the sight in the eye attacked, hence the necessity for cautioning all patients with gonorrhœa concerning the danger of allowing the urethral discharge to come in contact with the eyes. Gonorrhœal ophthalmia is a not common disease, and is almost unknown among persons of cleanly habits. Even among the lower classes it is rare. Ricord did not observe more than three or four cases per year among the many thousands of venereal patients treated at the Midi Hospital. Dron also only saw six cases during six years at the Antiquaille Hospital of Lyons. The right eye is more often inoculated than the left, probably because the right hand travels more frequently between the genital organs and the eye than the left hand. The disorder is seldom seen in women. Numerous instances exist of persons having purulent ophthalmia who have no urethral discharge, but who have accidentally inoculated themselves with the discharge of their companions. In such cases the inflammation is identical with that in gonorrhœal patients.

Gonorrhœal Conjunctivitis usually begins in from 12 to 36 hours after contagion, with symptoms very like those of ordinary catarrhal conjunctivitis, viz. itching, lacrimation, and congestion of the conjunctiva. In about twelve hours, however, its true nature becomes clear. The discharge, which at first is serous, soon becomes thick, yellow, purulent, and very copious. The eyelids swell and sometimes become everted. The conjunctiva is bright red and much swollen, so that it overlaps the cornea. There is also much aching pain in the eye and round the orbit, with great intolerance of light. If the inflammation is not quickly subdued, the cornea becomes swollen

and opaque, softens, and eventually ulcerates or sloughs. After this the aqueous humour escapes; the iris also protrudes, and becomes adherent to the opening in the cornea. The cornea may even separate in one piece, or break into several large fragments. Thus total destruction of the eye is produced. The constitutional disturbance is often very great, and the suffering in all cases is very severe. This disorder is also met with in infants who are inoculated during parturition, when the mother has a purulent discharge from the vagina. The course of the disease is so rapid that the eye is often destroyed in three or four days, and sometimes even in twenty-four hours.

The *prognosis* is, from the rapidity of the inflammation, very grave. Unless treatment be applied very early, it is impossible to prevent ulceration of some part of the cornea, while the risk of its total destruction is imminent, and the eye seldom escapes without permanent injury of some kind. Luckily only one eye is usually attacked, and when the inflammation subsides there is no tendency to its return.

Treatment.—The first point to be attended to is the protection of the sound eye, if only one be affected, by carefully binding it up and sealing it with collodion, so that the discharge cannot come into contact with it. Those who are about the patient must also be informed of the contagious character of the disease. As regards local treatment, the eyelids should be at once everted and the whole conjunctiva touched with solid nitrate of silver. This may require to be repeated in twenty-four hours if the inflammation be not checked. Afterwards the eye must be cleansed every hour, with a solution of alum (8 grs. to 1 oz.) Gosselin[1] strongly recommends the use of a lotion composed of one part of alcohol and three parts of water. He states that ulceration of the cornea happens less frequently with this than with any other application. The patient must be kept in a dark room. Lint soaked in ice-cold water should be applied over the closed lids, or, if pain be very severe, a lotion of belladonna may be used; and if the patient be robust, two or three leeches may be applied to the temple. Bleeding however is rarely necessary. If the chemosis be very great it must be relieved by free incisions radiating from the cornea. The margins of the eyelids should be kept moist with vaseline.

Bader[2] states that he has had very favourable results both in adults and children, from the application of an ointment consisting of one grain of red oxide of mercury and one fifth of a grain of sulphate of atropin to one drachm of vaseline. The ointment is to be freely pushed beneath the upper and lower lids thrice daily by means of a large

[1] Gosselin: Gazette des Hopitaux. 25 Dec. 1879.
[2] Bader: Lancet, May 1, 1880, and Brit. Med. Jour., Nov. 13, 1880.

soft camel's hair-brush, after the eye has been cleansed with tepid water. The application is to be continued three times a day as long as the lids remain swollen; afterwards, once a day till the discharge ceases. The sound eye is to be bound up with lint thickly smeared with the ointment every morning till the other eye is well.

In a case of acute gonorrhœal ophthalmia in a child, where the lids were so much infiltrated that it was impossible to expose the cornea, Critchett[1] divided the upper lid as far as the margin of the eyebrow, and attached the two flaps to the skin of the eyebrow by sutures; a solution of nitrate of silver (30 grs. to 1 oz.) was then painted over the whole conjunctiva three times a day, and the eye frequently cleansed with a solution of alum (10 grs. to 1 oz.). The child recovered with a healthy cornea. The divided edges of the lid were subsequently brought together, only very slight deformity being left.

The general treatment will vary according to the condition of the patient. If there be much fever a free purge should be given; but tonics are always needed. The diet must be good, with wine or beer if necessary. The after treatment depends on the amount of the injury caused to the eye. Chronic thickening of the conjunctiva will yield to stimulating lotions, blisters to the temples, &c.; change of air, good food, and tonics, such as tartarated iron, will often assist the local treatment. When the cornea has sloughed, the eye must be kept firmly bandaged, but there is seldom much to be done, for the sight is generally destroyed, and the treatment must depend on the condition of each particular case.

Gonorrhœa of the Rectum.—A purulent discharge from the rectum now and then occurs in both sexes. In nearly all cases it is the result of depraved habits, though in dirty women it may possibly be caused sometimes by the continual flow of gonorrhœal pus from the vagina over the anus. The symptoms are pain during defæcation, sense of heat at the anus, and discharge of pus. The irritation may produce ulcers, abscess, and fistula. Allingham[2] states that he has treated three cases of gonorrhœa of the rectum in prostitutes, all of whom acknowledged the manner in which they became affected. Tardieu[3] mentions having once seen a rather copious greenish discharge from the anus of a man who had had unnatural relations with another who was suffering from urethral gonorrhœa.

The greatest cleanliness is necessary in clearing away the discharge at frequent intervals. The bowel should be injected twice daily with dilute solution of acetate of lead and tincture of opium,

[1] Critchett: Lancet, April 3, 1880.
[2] Allingham: Diseases of the Rectum. 1871, p. 237.
[3] Tardieu: Etude Medico-légale sur les attentats aux mœurs. 6th edit. 1873, p. 235.

a slip of lint dipped in the lotion laid in each fold of the skin, and the bowels emptied regularly once every day. The patient should keep his bed, and have a spare unstimulating diet. If the disorder does not mend with these means, the patient should be put under chloroform, and the inflamed and ulcerated mucous membrane carefully dabbed with a solution of nitrate of silver, 20 to 30 grains to the ounce of water, through a speculum. The bowels should be kept quiet with opium for two days afterwards.

Gonorrhœal discharges from the *nose, mouth, ear,* and *umbilicus* have been described by certain authors, but cannot be considered to be fairly established. Edwards[1] reports the case of a widow who suffered from a purulent discharge from the nose, which was supposed to have been produced by the repeated use of a pocket-handkerchief which had been employed by her son, who was suffering from gonorrhœa, for a suspensory bandage. With regard to discharges of this kind, Diday[2] remarks that he has often rubbed gonorrhœal pus inside the nostrils, the lips, and the anus of patients who were suffering from gonorrhœa at the time, but without having been successful in producing a discharge.

[1] A. M. Edwards : Lancet. 1857, vol. i., p. 342.
[2] Diday : Thérapeutique des Mal. Vén., p. 129.

DIVISION V.

ACCESSORY VENEREAL DISORDERS.

CHAPTER I.

AFFECTIONS COMMON TO BOTH SEXES.

Abrasions of the mucous membrane of the genital organs of both sexes are very frequent accidents of intercourse. The furrow behind the corona and the frænum in men, and the fourchette in women, are the commonest sites for such abrasions which, though of little importance in themselves if both parties be free from disease, are nevertheless often a source of extreme anxiety to the patient, owing to the circumstances under which they have arisen. If neglected these breaches of surface may become inflamed, and set up swelling and phimosis in men or vulvitis in women. They are distinguished from chancres by their shallowness, by their irregular lacerated shape, and by the smarting which follows quickly after the intercourse which produced them. Simple abrasions quickly heal under cleanliness and the application of a lead, or sulphate of zinc lotion.

Warts or Vegetations.—These growths, which are not uncommonly seen on the genital organs of both sexes, consist simply of hypertrophied papillæ with increase of connective tissue and of blood vessels. They are in fact identical with simple warts of the hands and other parts of the body.

Warts do not owe their origin to any specific virus, nor are they necessarily connected with any venereal disease. It is true they are frequently met with in persons whose secretions are disordered by the presence of gonorrhœa, chancre or syphilis, but merely because those diseases are the most frequent cause of irritating discharges in this region; thus warts are sometimes seen growing on mucous patches, but simply from the irritation produced by the discharge.

To point out that these growths have nothing whatever to do with syphilis would be superfluous at the present day, did we not occasionally see 'syphilitic warts' mentioned in the medical journals and elsewhere.

To prove that warts are not a part of the general disease syphilis, it is only necessary to mention that they are amenable to strictly local treatment, are absolutely unaffected by general anti-syphilitic remedies, and are seen every day in persons free from any syphilitic taint.

Warts may be produced by any irritating discharge. They have been observed in young children quite free from any venereal disease.[1] They also occur in pregnant women free from venereal taint.

Warts do not secrete a discharge that will reproduce them on other persons; hence they are not contagious. This point, however, has been much contested. Petters[2] of Prague has entered fully into the question, and after a study of 336 cases concludes that warts may be produced by any local irritant causing an acrid discharge. More recently Petters[3] has returned to the question, and states that in the ten years which elapsed since his previous paper he had not seen a case in which warts had been communicated from one person to another. He also criticises the experiments by inoculation made by Kranz[4] in Lindwurm's clinic, and shows that the report of those cases is too inexact to be relied on as establishing the contagiousness of warts. Petters repeated Kranz's experiments on twelve men and four women, but he never succeeded in producing a wart. Thus, although it appears clear that warts may arise from irritating discharges of any kind, it remains to be explained why, among individuals apparently suffering from similar discharges, some suffer while others escape. The cause appears to be some peculiarity of constitution, and certainly one frequently sees various members of the same family with warts of the fingers. It appears probable that these are the persons who are most liable to suffer in after life from similar affections of the genital mucous membrane, if the exciting cause of an irritating discharge be present as well. In support of this view it may be mentioned that of fifty-five patients with genital warts, observed by Diday,[5] forty-seven had suffered from warts elsewhere during childhood. Martin[6] does not accept this view, but thinks that the lymphatic diathesis is the chief predisposing cause of warts; next to this he places diabetes. Judging from our own experience, we believe that inherited pre-disposition is the only genuine predisposing cause that has yet been made out. Certainly we have not found the lymphatic temperament especially frequent in patients with venereal warts.

[1] Boys de Loury et Costilhes: Gazette Méd. de Paris. 1847, and other authors quoted by Aimé Martin: Etude sur les Végétations, Annales de Derm. et de Syph. 1872-3, nos. 3 et 4.
[2] Petters: Prager Vierteljahresschrift für die prakt. Heilkunde. Bd. 91. 1866.
[3] Petters: Vierteljahresschrift für Derm. und Syphilis. 1875, p. 255.
[4] Kranz: Archiv für klin. Med. 1866. Bd. 2.
[5] Diday: Thérapeutique des Mal. Vén. 1876, p. 346.
[6] Aimé Martin: loc. cit.

Seat.—The most frequent seat of warts in man is the mucous membrane of the glans penis, especially in the furrow behind the corona, and the inner surface of the prepuce. In women the internal surface of the labia and nymphæ and the vaginal entry are most frequently affected, but in rare cases they extend along the vagina and even to the cervix uteri. On the perinæum and round the anus they are also not uncommon. In both sexes the growths are not very infrequent at and just within the meatus urinarius, and sometimes they extend for a considerable distance along the urethra.

Warts may be pedunculated or sessile. They are of a bright red or pinkish red colour, and may be small and isolated, or several may coalesce and form large masses. Some are very vascular and bleed easily; others do not bleed, but are exceedingly sensitive when touched. Their shape also varies according to their seat; behind the corona glandis they are often elongated and flattened like the crest of a cock. When situated beneath a tight prepuce, so that their secretion cannot get away freely, the warts often grow rapidly to such a size that the prepuce becomes enormously distended, and finally sloughs from the pressure of the growths within. Aimé Martin relates a case of this kind which had been neglected and which was attended by induration of the lymphatic glands, cachexia, and other constitutional symptoms of so grave a character that the patient was at first thought to be suffering from epithelioma.

The growth of warts is favoured by any condition that promotes congestion; thus they are very frequent and difficult to eradicate during pregnancy, when indeed they often attain an enormous size, and cause much suffering. They are then also very liable to become chafed and ulcerated, in which condition they secrete a copious, acrid, and horribly foul discharge that causes great irritation of the surrounding skin.

The *termination* of large warts is sometimes by inflammation and sloughing; small ones often remain stationary for years, or gradually wither away and disappear spontaneously. The large growths peculiar to pregnancy commonly disappear after delivery.

Diagnosis.—The diagnosis of warts rarely presents any difficulty. In cases of phimosis, however, such as that of Martin already mentioned, there may be temporary difficulty in making the diagnosis from epithelioma. Rest and cleanliness however will quickly ameliorate the condition when due to simple warts. The age of the patient must also be taken into account.

Treatment.—The first point to be ascertained is the nature of the morbid secretion or discharge that has caused the warts, and if possible to remove it. The local treatment of the growths themselves will depend on their seat, size, and form, and whether they are sessile or

pedunculated. The different plans of treatment comprise the application of desiccants, astringents, or caustics; and removal by the ligature, cutting instruments, some form of cautery, or the écraseur.

When the growths are small and sessile the observance of strict cleanliness and the daily application of the Liquor plumbi subacetatis with a camel's-hair brush often causes them to wither slowly and painlessly, or perchloride of iron may be applied in the same way. A powder composed of equal parts of burnt alum and savine is also used by some surgeons, and is sometimes successful. Again, if the parts be kept scrupulously clean and dry, the growths sometimes disappear without any special application.

When milder measures are unsuccessful, caustics should be used. Of these nitric acid and glacial acetic acid are the most convenient. If nitric acid be used the growth must be dried and the acid thoroughly applied, especially to its base, by means of a piece of wood small enough to pass in between the eminences, so that the caustic may come in contact with every part. The wart turns yellow at once, and if small soon shrivels and drops off; but if the growth be of any considerable size several applications will be necessary. Glacial acetic acid produces less pain than nitric acid, and causes the tissue to liquefy and as it were melt away. Chromic acid is more powerful than either of the preceding, but it causes severe pain. The acid nitrate of mercury is also used, but does not present any advantages over nitric acid.

Pedunculated warts, if small, may be treated by the simple application of a ligature, when they will drop off in a few days; or they may be snipped off with a pair of scissors, and the base touched with lunar caustic. Excision is the best mode of getting rid of larger growths, such for instance as luxuriate beneath the prepuce in some cases of phimosis. The prepuce must of course be slit up or removed altogether. The body of the penis should then be grasped firmly in the left hand, while the growths are thoroughly removed with scissors curved on the flat. Free bleeding always occurs and must be controlled by pressure and the application of solution of persulphate of iron.

Warts of the meatus urinarius may be ligatured or cut off if pedunculated; if sessile they should be cauterised with nitric acid or Paquelin's cautery. When situated in the female urethra similar treatment will usually suffice, but in the urethra of the male their treatment is not so simple a matter, indeed it is sometimes impossible to extirpate them completely. Rollet recommends compression of the growths by a bougie coated with some astringent drug, or removal by means of Leroy's (d'Etiolle) curette. Martin uses a bougie with a bulbous head, behind which he places an oint-

ment containing caustic. The bougie is then rapidly introduced until the end is just beyond the seat of disease; the caustic thus comes in contact with the growth. Martin states that this plan of treatment has proved useful in his hands. The porte-caustique of Lallemand has also been used for a similar purpose, but with this instrument it would be impossible to limit the application of the caustic to the part affected. Probably the best mode of procedure is to localise the growth within the field of the endoscopic tube, and then to cauterise it with a wire coated with nitrate of silver. We have adopted this plan of treatment with success in some cases. In the course of time, however, the growths in many cases drop off spontaneously.

Large masses, such as those which sometimes occur about the female genitals, should be removed by means of the galvanic wire, or by the écraseur. The loop should be tightened very slowly, in order to guard against hæmorrhage subsequently.

The large rapidly growing warts which occur in pregnant women should not be interfered with until after the confinement is over; first, because of the risk of bleeding and of inducing abortion; secondly, because they often disappear spontaneously after the termination of pregnancy. Much may be done, however, to lessen the inconvenience by strict attention to cleanliness, and the application of disinfectants, followed by sprinkling with oxide of zinc or some other absorbent powder.

Herpes of the genital organs.—*Herpes Progenitalis* (Willan). This troublesome disease is also sometimes called herpes preputialis, an obvious misnomer, for the disease may attack the genital organs of both sexes, though it is very much more common in men than in women. The affection consists in the development of small vesicles on an inflamed area. Occasionally there is only one vesicle, but as a rule there are several grouped together.

The most frequent seat of the eruption is the inner surface of the prepuce, but it also occurs on the glans penis. The outer surface of the prepuce and the sheath of the penis are also occasional seats. In women it may occur on the labia majora, the mons veneris, the prepuce of the clitoris or the nymphæ; in the two last situations it is very rare.

An attack of herpes is not always preceded by any disturbance of the general health, but commonly the attack follows disordered digestion. The first local symptom that attracts the patient's attention is a slight itching or burning sensation at and about the spot where the eruption afterwards appears. According to Doyon,[1] who

[1] Doyon: De l'Herpès récidivant des parties génitales. Paris. 1868.

has written an elaborate essay on this affection, this preliminary uneasiness may also be felt in the urethra as far as the fossa navicularis. In the course of a day or less the itching becomes localised and a varying number of minute papules can be seen on an inflamed area; these papules very quickly become vesicles, the serum of which soon becomes turbid. The vesicle then begins to shrivel, the inflammation disappears, and, at the end of about five days from the beginning of the attack, there remain only minute scabs corresponding to the site of each vesicle. These also quickly drop off without leaving any scar.

The course which has just been described is that of an uncomplicated attack of the ordinary kind. Diday[1] describes some unusual variations from the ordinary course: he states that in some cases the affection appears as a simple red patch, as a slight excoriation, or, if the part have been rubbed, as a fissure. The same author also asserts that herpes sometimes occurs in the urethra, especially when the exciting cause has been a gonorrhœa. It produces a slight serous discharge from the urethra with pain on micturition, the whole disorder subsiding in about a week. We have not observed this variety.

If the eruption be irritated by the application of caustics, by dirt, sexual intercourse or other means, the inflammation increases greatly; the spots may suppurate, spread, and even become gangrenous, as in a case related by Mauriac;[2] but short of this, irritation of any kind may prolong the course of the affection to several weeks. In such cases also the inguinal glands may become tender, and in rare cases we have seen suppuration take place.

Pain around the hips, in the groins and inside of the thighs is not a very infrequent associate of herpes progenitalis, but in certain rare cases severe neuralgia precedes the eruption. The nerves attacked are the sciatic, sacral or pelvic nerves. Mauriac[3] has recorded examples of this form of herpes. Bumstead and Taylor[4] also relate the case of a man who when fifteen years old was first attacked by sciatica, which returned about four times yearly for twenty years, the attacks being accompanied seven times out of ten by herpes of the penis. The pain also at the site of the eruption, usually not more than tingling or itching of moderate amount, is sometimes very severe, and is described as being of a burning and aching character.

The nature and causes of herpes of the genital organs has given rise to much discussion. Doyon[5] is of opinion (1) that it only occurs in persons of the "dartrous" diathesis; and (2) that it has always been

[1] Diday: loc. cit., p. 139.
[2] Mauriac: Ulcérations non-virulentes des Organes génitaux. 1878, p. 49.
[3] Mauriac: Herpès Névralgique des organes genitaux. Paris. 1876.
[4] Bumstead and Taylor: loc. cit. p. 247.
[5] Doyon: loc. cit.

preceded by some venereal affection, most frequently by the local chancre. Diday[1] agrees with Doyon in these views; and further, considers that a chancre which has been cauterised is by far the most powerful exciting cause of herpes. Doyon states that the first attack of herpes usually appears about two or three weeks after the healing of a chancre or the termination of a gonorrhœa. This first outbreak is generally ill-marked, and is situated at or very near the site of the preceding venereal sore, hence the patient is likely to think it a manifestation of syphilis.

We cannot speak so decidedly as do French authors concerning the necessity of some preceding venereal disease; indeed we have seen herpes in one or two patients who denied ever having had sexual intercourse. We have observed that herpetic patients are either gouty or of the lymphatic temperament. By 'gouty' we do not mean only sufferers from ordinary gout, but persons who have relations that suffer from gout, and who themselves are liable to eczema, neuralgia and other affections common in gouty people.

The most marked characteristic of herpes progenitalis is its tendency to recur at intervals, for long periods of time. The interval varies in length. Most commonly two or three months elapse between the attacks; but in some cases we have known the herpes reappear every three weeks with almost undeviating regularity. These repetitions are the source of great anxiety to the patient, who becomes more and more difficult to convince that his disease is unconnected with syphilis.

In a person who has once suffered from the affection, very slight causes, such as excess in eating or drinking, fatigue, disorder of the digestive organs, or sexual intercourse, are often sufficient to bring on an attack, especially if the patient has not suffered recently.

After having recurred at intervals for several years, the attacks usually get less and less severe until finally the tendency to the disease wears out, and the patient ceases to suffer from it, unless a fresh attack of venereal disease intervene and, as it were, give a new impulse to the disorder. Sometimes the intercurrence of another disease seems to put an end to the particular state of the system which produces herpes. Thus we have lately had under observation a patient who suffered repeatedly from herpes, which began a few months after the healing of a simple chancre in 1878. In the autumn of 1879 the patient contracted syphilis, and from that time was no more troubled with herpes. Doyon also states that he has seen a similar cessation, in one case after an attack of small-pox, and in another after an attack of hæmorrhoidal congestion.

[1] Diday: Thérapeutique des Mal. Vén., p. 141.

Diagnosis.—An ordinary case of herpes is not likely to be mistaken for any other disease. The group of vesicles with red areola, and the preceding slight itching or burning, together with the freedom of the lymphatic glands, are sufficiently characteristic, and its disappearance under simple cleanliness within a week would leave no doubt as to its nature. If, however, irritation be set up either by the application of caustics, or neglect of cleanliness, and especially if the patient be in bad health from alcoholism or other cause, the spots may become ulcers that spread rapidly and produce many of the consequences of the inflamed chancre. In cases where the affection is first seen in such a stage, the diagnosis will often be doubtful for a time. The effects of auto-inoculation may be of assistance under these circumstances.

The diagnosis of herpes from the initial lesion of syphilis is seldom difficult. The absence of an indurated base to the erosion, of indolent multiple glands and other characters of syphilis are clear distinctions. It must be remembered, however, that the herpetic eruption may furnish the breach of surface through which the syphilitic virus gains entrance into the system, in which case of course there may be no change in the part until the period of incubation proper to syphilis has elapsed. Again, herpes may appear at a spot where the syphilitic poison has been previously absorbed; and if the appearance of the initial lesion coincide with that of the herpes, the spots of the latter may become indurated, forming the so-called 'herpetiform chancre.'

Treatment.—The treatment of the herpetic eruption is very simple. Bathing the part twice or three times a day, followed by the application of a little starch or oxide of zinc powder, and the interposition of a piece of fine linen rag between opposed surfaces, is all that is necessary in simple cases. For the few cases where ulceration and spreading take place, the treatment must be similar to that of inflamed chancre, which has been already described.

The treatment of the disposition to herpes is difficult and often ineffectual. We have seen benefit in some cases from the administration of alkalies, colchicum, and similar remedies directed against the gouty diathesis. Regular habits, moderate diet, and the avoidance of malt liquors and of effervescing wines, are also beneficial. When the approach of an attack of herpes is announced by symptoms of dyspepsia, a smart cholagogue purge, followed by salines for two or three days, will sometimes ward off the attack; but this premonition is often wanting. We have also been in the habit of directing the patient to use an astringent lotion twice daily, with the hope of hardening the mucous membrane and rendering it less sensitive; this plan of treatment has proved beneficial in some cases. Circumcision

has been had recourse to, often at the earnest request of the patient himself, with the hope of thereby checking the tendency to the disease. Greenough,[1] for example, states that in cases where he has practised it, the patients have seldom had more than one or two attacks subsequently. We have adopted this measure in a few instances, but without success; for although the prepuce had been formerly the seat of the eruption, the vesicles appeared elsewhere after its removal.

Diday and Doyon assert that the local and general use of sulphurous waters at some bathing place is the only efficient method of treating the diathesis that causes herpes. Of the numerous springs which yield water of this kind, that of Uriage, of which M. Doyon is the inspector, is, in the opinion of these gentlemen, the only one that can be relied upon for cure.

Phtheiriasis of the genital region is a very common affection in persons who indulge in promiscuous intercourse.

Phtheiriasis depends simply on the presence of the Phtheirius or Pediculus pubis, commonly called the crab-louse, from the peculiar shape of its body, and the tenacity with which it clings to the hair with its crab-like claws. Crabs infest especially the hair of the pubic region, but in hairy people they may travel to the chest and axillæ, or even to the whiskers or eyebrows; they never remain among the hair of the scalp.

The pediculi usually cause intense itching, which is aggravated when the patient is warm in bed. The irritation of the pediculi, and the scratching resorted to for its relief, frequently give rise to a papular rash about the pubes and upper parts of the thighs. These papules, in dirty people, may become pustular, and then sometimes cause enlargement and even abscess of the lymphatic glands. Often, however, but little inconvenience is caused, and it is very common to find hospital patients entirely ignorant of the presence of these parasites. The insects are easily seen, and the semi-transparent eggs can also be distinguished adhering to the hairs.

Washing with soap and hot water, and the plentiful application of the ammoniated mercury ointment, quickly kills the pediculi. Blue ointment is very effective, but there is danger of causing salivation if it be rubbed in freely. A solution of perchloride of mercury in dilute acetic acid or spirit (2 grains to the oz.) may be prescribed when the patient objects to a greasy application; but whatever parasiticide is used, must be continued until all the eggs have been got rid of as well as the pediculi themselves.

Scabies is sometimes limited to the genital organs, and in such

[1] Greenough: Archives of Dermatology. 1881, p. 1.

cases is not infrequently mistaken for a venereal affection. The irritation produced by the acarus, and the consequent scratching on the part of the patient, cause a rash consisting of vesicles, papules, and pustules which, like phtheiriasis, may cause enlargement and even suppuration of the glands of the groin.

The intense itching, more severe at night, the presence of the furrows produced by the acarus, and, if careful search be made, the discovery of the acarus itself, render the diagnosis easy. General scabies is sometimes mistaken for a syphilide by careless observers. The characters just mentioned, together with the absence of syphilitic lesions elsewhere, are of course quite sufficient to prevent such a blunder.

ACCESSORY VENEREAL DISORDERS.

CHAPTER II.

AFFECTIONS PECULIAR TO MEN.

Balano-Posthitis.—Inflammation of the opposed surfaces of the glans penis (*balanitis*), and of the prepuce (*posthitis*), is a very common affection in dirty people, especially when the foreskin is long. Balano-posthitis (sometimes wrongly termed inflammatory phimosis) may be acute and general, or chronic and limited to the furrow behind the corona. The affection may be produced by various causes. Simple accumulation of secretion from want of cleanliness often gives rise to it, but it is also caused by irritation from the discharge of gonorrhœa, warts, chancre, or primary or secondary syphilitic lesions. The irritation excited by the saccharine urine in diabetic patients, or by the presence of small-pox pustules is also an occasional cause of balano-posthitis.

Fournier attributes two thirds of the cases of balano-posthitis to the presence of a long prepuce, with insufficient cleansing; about one third to gonorrhœal or chancrous pus; and a few to the irritation of chafing during intercourse or contact with vagino-uterine discharges of non-specific nature.

The Symptoms depend on the intensity and extent of the inflammation. In the simplest form they are limited to a sense of heat and itching of the furrow and slight redness of that part, with a milky or yellowish secretion. When more extended, all the symptoms are more marked, with the addition of pain and swelling.

On turning back the foreskin the surface of the glans and inner prepuce is seen to be bright red, bathed in pus of disagreeable odour, and presenting the appearance of having been scalded. Numerous shallow erosions form, not usually penetrating more deeply than the epithelium, but often coalescing into large raw abrasions. When the inner lining of the foreskin is denuded, the urine trickles over it and causes severe pain. If much irritated by the

presence of a chancre or by caustic lotions, the erosions spread over the whole surface, and the discharge is tinged with blood. Even ulcers may form and spread rapidly. The foreskin then becomes red and swollen, and can no longer be drawn back. When this is the case, the discharge often accumulates within the prepuce and produces a fluctuating swelling. In rare cases sloughing of the prepuce occurs, with protrusion of the glans penis through the opening thus produced. Constitutional disturbance and fever are present in such aggravated cases, which, however, form only a small proportion of the whole number. In the majority the inflammation does not pass beyond swelling and excoriation, with free purulent discharge.

Complications.—The cellular tissue of the sheath, the lymphatic ducts along the dorsum penis, or the lymphatic glands may inflame and even suppurate. In persons of debilitated habit, through alcoholism, exposure, starvation, or other causes, sloughing may occur. Adhesions are not infrequently caused by balano-posthitis, usually about the furrow and corona; but they may attach the prepuce completely to the glans. Thickening of the prepuce and phimosis also result from repeated attacks.

The duration of balano-posthitis depends on the application of proper remedies. In uncomplicated cases, properly treated, the disease usually subsides in four or five days. When phimosis prevents exposure of the parts, the course is severe and the duration much longer. Even when the affection is limited to the furrow it is often obstinate unless sedulously treated.

The Diagnosis is easy when the parts can be exposed. *Herpes* is distinguished by small round shallow ulcers limited to one or two points of the mucous surface, without general inflammation. *Chancre* has well defined undermined edges and a spongy surface. The *syphilitic* sore has an indurated base, and is accompanied by enlarged lymphatic glands.

When there is phimosis, the diagnosis is sometimes difficult. The pus exuding from the orifice of the prepuce may come from the urethra or from a chancre. If from the urethra it can usually be seen escaping from that canal after the discharge which has collected at the meatus has been wiped away. Should the foreskin be too much swollen and too long for the meatus urinarius to be exposed, the discharge which has collected under the foreskin should be washed away with a syringe and a small aural speculum passed down to the meatus. In urethritis there will of course be other signs, such as heat and soreness, felt not merely at the orifice but along the canal.

If there is a chancre under the foreskin its situation is betrayed by a tender spot, usually somewhere near the corona, and when the

inflammation has continued for a few days, there are usually consecutive sores at the free border of the prepuce.

Treatment.—The treatment of balano-posthitis from simple irritation and accumulation of secretion consists mainly in strict cleanliness. The parts must be washed with soap and water twice or thrice a day according to the severity of the case; they should then be dabbed as dry as possible and sprinkled with powdered oxide of zinc. A piece of lint should be placed in the furrow to keep apart the inflamed surfaces when the foreskin is drawn forwards. In some cases the application of lint soaked in a solution of sulphate of zinc (two or three grains to the ounce) answers better than the powder. By these means the affection is usually cured in a few days. When the disorder is very chronic and limited to the furrow, it should be well washed with soap and water and then painted with a solution of nitrate of silver, ten or fifteen grains to the ounce. The excess of caustic solution should be wiped off, and a piece of lint laid along the furrow. Simple cleanliness then suffices to complete the cure. When the prepuce cannot be retracted, the discharge must be washed away by frequently injecting tepid water between the glans and the foreskin with a long nozzled syringe, after which lead lotion (F. 20) should be injected. When sores or gonorrhœa are present as well, the treatment appropriate for those affections must be added to those already described for the balano-posthitis. The œdema of the foreskin is often much relieved by free acupuncture.

Phimosis.—A condition of the foreskin which prevents exposure of the glans penis. It may be congenital or acquired.

Congenital Phimosis.—In this form the prepuce is long, the orifice alone being too narrow, or the whole foreskin more or less contracted. Shortness of the frænum may also impede retraction of the prepuce. During childhood, the irritation caused by phimosis may give rise to incontinence of urine or to symptoms resembling those caused by stone in the bladder; but in many cases no inconvenience arises until after puberty, when it becomes troublesome in many ways; for example, by retaining the usual secretions of the part, phimosis causes balano-posthitis. The covering of the glans and inner surface of the foreskin are also kept continually in an irritable condition, and are thus liable to become abraded during sexual intercourse, and the absorption of venereal poison is facilitated. The constricted orifice also is very liable to split under the same conditions. Congenital phimosis in some cases appears to be the cause of various reflex affections, besides encouraging the practice of masturbation and exciting a premature craving for sexual intercourse.

Acquired or accidental phimosis may be due to many causes. In

gonorrhœa temporary phimosis is not infrequent, from the swelling of the foreskin accompanying lymphangitis, and a partial but more permanent form occasionally arises from the chronic œdema that sometimes remains in such cases.

Inflamed chancres often give rise to phimosis when situated on the inner surface of the prepuce or on the glans, especially if the former be at all narrow. In such cases, sloughing may occur.

In syphilis the induration of the initial manifestation not infrequently prevents retraction of the foreskin, until the hardness has been absorbed. Subacute lymphangitis in syphilis may also give rise to temporary phimosis. Contraction and thickening of the foreskin, following chancres or syphilitic sores, especially when these are seated near the preputial orifice, frequently cause a very obstinate form of phimosis. Besides these strictly venereal causes of phimosis there are others, *e.g.* balanitis and warts, which are not uncommon.

Treatment of Phimosis.—In the congenital form, when no disease complicates matters, if the degree of narrowness be moderate, and the prepuce not very long, gradual dilatation usually succeeds. Some kind of dilator may be inserted daily for a few minutes, and gradually widened, so as to stretch the foreskin without drawing blood or tearing the surface. After a few repetitions, the orifice becomes wide enough to slip easily over the corona. If this do not succeed, a cutting operation will be necessary. If the constriction be strictly limited to the orifice of an otherwise normal prepuce, it often suffices to slit up the skin and mucous membrane for about half an inch. The cutaneous and mucous surfaces should then be neatly sewn together by means of a continuous suture. Forcible splitting of the mucous layer of the prepuce has been practised, but is not to be recommended, as the subsequent contraction of the torn tissues often gives rise to more narrowing than that which previously existed. Hué[1] of Rouen divides the prepuce gradually by the elastic ligature, and states that the subsequent appearance of the parts is everything that can be desired. When the whole extent of the prepuce is much narrowed, circumcision will be necessary.

When phimosis occurs as a complication of gonorrhœa, the patient should lie down continuously, with the penis wrapped in lint, kept wet with lead lotion (F. 20), which must also be freely syringed beneath the swollen prepuce every two or three hours. By these means, combined with a smart purge, the swelling usually subsides in a few days, and the amount of constriction is very rarely so great as to call for operative measures.

As a complication of inflamed and sloughing chancres, phimosis is a

[1] Hué : Progrès Médical. 11 Mai, 1878.

more serious affection, and if not promptly treated, often gives rise to considerable destruction and permanent deformity of the parts. When the inflammation and swelling are not very great, and when the parts are not too sensitive to allow of the necessary manipulation, careful cleansing of the preputial cavity by means of a syringe with a nozzle long enough to reach beyond the corona glandis will be all that is required, provided that the patient remain at rest. Every two hours tepid water should be used to clear away the discharge, after which a lotion of lead (F. 20) or carbolic acid (F. 21) should be injected. If the syringe cannot be inserted owing to the excessive degree of swelling or hardness of the tissues, and in any case if sloughing be going on, more active measures will be necessary. Gillette[1] and Gamberini[2] recommend the gradual dilatation of the prepuce with sponge tents. We have never practised this mode of treatment. Exposure of the diseased parts must be effected either by division or complete removal of the prepuce. The most usual operation consists in simply slitting up the prepuce on its dorsal aspect. There are two objections to this mode of procedure : thé first is that when there is much swelling, as is most frequently the case, simple division of the prepuce does not completely expose the diseased surface, the discharge cannot escape freely, and the subsequent dressing gives great pain. The other objection is that a subsequent operation is necessary for the removal of the flap. R. W. Taylor[3] recommends division of the prepuce by two lateral incisions, which leave two flaps, an upper and a lower one. It is true that this method of operating answers well as far as the complete exposure of the parts is concerned, but here also a subsequent operation for the removal of the flaps becomes a necessity. For these reasons, when any cutting operation is called for, we prefer to remove the prepuce altogether. We have never seen harm result from this practice, and it has the great advantage of doing away with the need for any second operation.

The following plan was adopted when I was House Surgeon to the Male Lock Hospital : The body of the penis was grasped firmly with the left hand. With a strong pair of scissors the prepuce was next slit up throughout its whole length. By a few more strokes of the scissors it was removed level with the corona, the frænum being also divided if necessary. Pellets of cotton wool soaked in solution of persulphate of iron were then pressed on the bleeding points and left in situ, and a strip of lint was wound round the raw surface. The dressing remained undisturbed for twelve or twenty-four hours, and the patient was then immersed in a warm bath in the manner described in the treatment of Chancre. Very little pain was experienced under this mode of treatment, and the wound usually healed kindly and rapidly.—A. C.

[1] Gillette : Amer. Jour. of Syph. and Derm. 1872, p. 104.
[2] Gamberini : Giorn. Ital. d. Mal. Ven. e d. Pelle. 1873.
[3] R. W. Taylor : Amer. Journ. of Syph. and Derm. 1872. October.

In cases where it is not intended to carry out immersion after the operation the parts must be thoroughly cauterised and the surrounding skin cleansed with carbolic acid lotion, the patient being under the influence of an anæsthetic.

Phimosis caused by the initial lesion of syphilis usually disappears readily under the influence of specific general treatment, when simply due to excessive induration; the use of a lead or carbolic lotion with a long-nozzled syringe being all the local treatment necessary. If, however, the initial lesion slough, or if the parts become strangulated, the same treatment as that recommended in the case of chancre must be employed.

Phimosis from balanitis should be treated by frequent subpreputial syringing. (See treatment of balano-posthitis.)

Warts, when very large, sometimes distend the prepuce to the extent of causing sloughing. In this case the obvious plan of treatment will be the removal both of prepuce and warts.

Cicatricial phimosis must be treated according to the circumstances of the case. If the constriction be slight, a limited division of the prepuce may suffice. But if the parts be much deformed by hard cicatricial tissue or held together by adhesions, circumcision should be performed. If the prepuce and glans be adherent, they must be separated by careful dissection.

Paraphimosis.—This condition is just the reverse of phimosis, *i.e.*, instead of inability to retract the prepuce, it cannot be drawn forward after it has been retracted.

Partial phimosis is a frequent cause of paraphimosis: for example, if a prepuce which is too tight to slip back easily be retracted and not at once replaced, the glans begins to swell and soon grows too large to allow the narrow foreskin to slip forwards. The orifice of the prepuce, which forms the constricting ring, tightly encircles the penis behind the corona, and soon becomes hidden at the bottom of a deep sulcus situated between the swollen mucous layer of the foreskin which forms a large prominence in front, and the cutaneous layer behind. The swelling quickly increases, and excites great pain until sloughing of the over-strained free border relieves the strangulation. If relief be not afforded adhesive inflammation then fastens the prepuce to the corpora cavernosa in its new position, and finally leaves the thickened retracted foreskin much disfigured with a knob-like projection beneath the glans.

Paraphimosis is a frequent complication of venereal diseases. When the foreskin is short or habitually worn retracted, inflammatory swelling of the glans or prepuce, caused by a sore or gonorrhœa, may prevent the prepuce from being brought forward. In such

cases, the mere existence of a retracted and swollen prepuce does not always indicate that forcible reduction is necessary.

Treatment.—When a prepuce naturally so narrow that it clips the glans has been accidentally retracted, reduction should always be effected without delay; otherwise some amount of strangulation is nearly certain to occur, with permanent deformity of the parts.

When a patient who habitually wears the glans uncovered, becomes affected by any disease, venereal or otherwise, which causes either on the one hand, swelling of the glans or, on the other, swelling of the retracted prepuce, the treatment must be by rest, cooling lotions, and other means calculated to reduce the swelling. When this has subsided the parts will resume their normal condition. Only when the constriction is so tight that there is danger of sloughing should an attempt at reduction be made. Supposing, however, this to be the case, reduction should at once be proceeded with.

To bring forward the foreskin, the penis should be grasped by the left forefinger and thumb in the form of a ring, while the thumb and two next fingers of the right hand compress the glans till it is small enough to allow of the foreskin being brought forward. This is always very painful, and both suffering and time are saved, when the paraphimosis has existed more than a few hours, by putting the patient under chloroform before the reduction is attempted. If the foreskin has been kept behind the glans long enough for the strangulation to be liberated by ulceration, it is better simply to release any tight bands that may remain, and when the parts have healed, to trim away the deformities.

Rupture of the Frænum.—This is a common accident during intercourse when the frænum is too short. Before it gives way the glans is drawn tight underneath during erection, and intercourse is often rendered very painful. When torn through, the hæmorrhage is sometimes very smart, especially if the meatus is lacerated; and though such a consequence is extremely rare, a large quantity of blood may be lost this way before the bleeding ceases, as the patient has seldom sufficient presence of mind to pinch the part tightly between the thumb and finger till the erection has subsided. The bleeding should always be arrested by cold applications, styptics, or by ligature. The ligature is best if the artery of the frænum is the bleeding point. We have seen the blood spring from the erectile tissue at the meatus in a stream as large as a crow quill by a recurrence of the bleeding two hours after the accident had happened. It was only arrested by transfixing the bleeding part with a fine harelip pin, and applying a twisted suture. Acupressure or a ligature should always be applied in these cases; for if the

bleeding have been arrested by cold or styptics alone, it may begin again when the patient gets warm in bed and the surgeon has left him.

If the shortness of the frænum render intercourse painful, it should be divided by passing a narrow bistoury underneath it.

Rupture of the Erectile Tissue of the Penis, with extravasation of blood, or hæmorrhage from the urethra, may be caused by violent repeated intercourse; it also occurs sometimes during the chordee and distension accompanying acute urethritis. The amount of blood lost in this way may be very great, and cause syncope—even death. The case of Fournier, related in a previous chapter, arose from sexual excitement during the course of gonorrhœa. Langston Parker[1] relates a case where hæmorrhage from the urethra, which lasted three days, was accompanied by extravasation into the corpus cavernosum, and followed by stricture. A young man was brought into University College Hospital a few years ago on account of hæmorrhage from the urethra which had come on after a night of violent sexual excitement. When he was brought into the hospital the blood flowed from the urethra so rapidly that at first sight he appeared to be evacuating the bladder; the quantity lost before his admission was sufficient to drench his clothes, and bring him near to syncope. In this case the hæmorrhage was arrested in a few minutes by applying ice to the perinæum and the penis, while ice-cold water was injected through a double current catheter, for the point whence the hæmorrhage proceeded was not made out at the moment. After lying in bed with a catheter in the urethra for two days, he left the hospital free from pain and able to pass his water freely, and was seen no more.

When the urethra is lacerated, urine is very apt to percolate into the corpus spongiosum, and produce abscess or sloughing of the penis. Dron[2] relates the case of a young man who attempted intercourse while suffering from chordee, the consequence being rupture of the urethra and extravasation of urine into the scrotum, groins and other parts.

Sometimes the urethra is not ruptured, and the blood then percolates into the corpora cavernosa without escaping externally. The penis is distended, painful, and swollen at one place, over which the skin is often red, or even black, according to the extent of the rupture and the amount of blood that is extravasated. Langston Parker has seen the effusion extend from the penis to the scrotum and perinæum in very serious cases, but this is exceptional. The results of extravasation are, first, violent aching pain in the penis,

[1] Langston Parker: Brit. Med. Jour. May 16, 1868.
[2] Dron: Lyon Médical. 1 Juillet, 1877.

which is very acute during micturition; the passage of urine may even be arrested altogether by the swelling of the extravasation. When no great amount of tissue is lacerated, the extravasated blood is soon reabsorbed, and the penis regains its ordinary condition. Not unfrequently, however, adhesive inflammation glues and binds portions of the erectile tissue together, so that the penis is distorted during erection, sometimes so much so that intercourse may be impossible. Stricture of the urethra is a frequent consequence if the corpus spongiosum has been torn. The immediate treatment consists in complete rest in bed, cold to the perinæum and to the swollen part by applying ice-cold cloths round the penis or by maintaining a continuous cold current through Otis's coil or Leiter's tubes. The after treatment must depend on the nature of the case; stricture of a troublesome kind is a very frequent result of this accident.

Circumscribed Induration of the Corpora cavernosa.—This curious affection, which has nothing to do with syphilis, nor indeed with any venereal disease, is mentioned here because the hard lumps produced by it are often mistaken for gummata. It is characterised by the presence of circumscribed, thickened, and hardened areas in the fibrous sheath of the corpora cavernosa. There may be one or several such lumps. The most frequent seat is the dorsum penis, but they may occur at either side or in the septum, and we have also seen them in the crus penis. Slightly tender, these indurated plates cause little positive pain unless the part be pressed or handled. The affection is slow in development, and the indurations are slowly absorbed without leaving any permanent contraction. The duration of each hard area varies from several months to one or two years, but the affection may continue much longer than this by the formation of consecutive patches. While the patches remain they interfere with erection and produce a crooked state of the organ. Van Buren and Keyes[1] report six cases which are apparently of this kind. Sir James Paget[2] considers that the affection is due to gout, and indeed this is the generally received opinion in this country; certainly the gouty diathesis was present in all the cases that have come under our observation.

Diagnosis.—The only deposits with which they are likely to be confounded are gummata. The gristly plates of the gouty affection are always shallow, and are situated in the fibrous sheath of the corpus cavernosum, while the skin moves freely over them and never becomes involved. They do not approach the surface. A gumma may be deeply placed in the substance of the corpus cavernosum and

[1] Van Buren and Keyes: Diseases of the Genito-Urinary Organs. 1874, p. 24.
[2] Sir James Paget: Clinical Lectures and Essays. 2nd edit. 1879, p. 379.

only indistinctly felt in its early stages, but as it grows it approaches the surface, and if not checked by treatment ulcerates and breaks down in the well-known characteristic manner. The history of the case, the presence or traces of syphilis elsewhere, and the effects of treatment on the gumma while the gouty affection remains uninfluenced by any treatment at present known, will after a time remove all doubt as to the nature of the disease.

ACCESSORY VENEREAL DISORDERS.

CHAPTER III.

AFFECTIONS PECULIAR TO WOMEN.

Vulvitis.—*Simple vulvitis* is a very common disorder, and may arise from a variety of causes. It has already been sufficiently described among the complications of vaginitis (p. 575).

Inflammation of the Follicles of the Vulva.—Follicular vulvitis.—This rare disease, of which we have seen well marked examples, is according to Huguier [1] generally produced by want of cleanliness in hot weather, combined with irritation of the parts through a long journey on foot, violent oft-repeated intercourse, masturbation or pregnancy. It begins with the formation of small projections on the surface of the nymphæ, prepuce of the clitoris, and both surfaces of the labia; those on the outer surface always beginning in a hair follicle. They vary in number between three or four and forty or fifty, scattered indifferently over the surfaces affected. The little eminences in a day or two become pustules, which break and leave small ulcers with sharply cut edges. In a short time, if the irritation is allayed by rest and cleanliness, they heal, and leave no mark, or only a very slight one. The irritation of the pustules causes violent itching, which soon increases to smarting or burning; the mucous membrane swells, and secretes a very offensive viscid mucus; this glues the parts together, and dries into thick crusts, under which excoriations form. When the inflamed follicles are few, there is not much irritation, and the ulcers heal up, but are followed by others, so that the disorder may continue a long time, or relapses follow each other repeatedly unless arrested by treatment.

The *treatment* is very simple: cleanliness by means of baths, warm lotions, separation of the parts by placing strips of linen rag between them, a saline purge, and rest. If the pustules have extended into

[1] Huguier: Mémoires de l'Académie de Médecine, t. xv. 1850.

ulcers, they must be kept clean, and dressed with black-wash until they heal.

Inflammation of the Vulvo-vaginal (Bartholine's) glands.—These small racemose glands, which are analogous to Cowper's glands in the male, are situated on each side of the entry to the vagina, beneath the furrow lying between the labium majus and minus. In the natural condition the gland is too small to be felt, being about as large as a pea, but when diseased it can often be distinguished near the lower part of the nympha, on the inner aspect of which the excretory duct opens close to the caruncule myrtiformes. Its orifice can be readily seen if the labium minus is put a little on the stretch. The secretion, in the natural state, is a transparent and somewhat viscid fluid, but becomes purulent when the gland is inflamed.

Hypersecretion of the gland is frequent among women of lascivious habits. If such a person is examined, the gland can sometimes be felt as a small globular body, and gentle pressure of the finger will cause a drop or two of the secretion to flow out of the excretory duct. Sometimes these glands eject their contents during sleep, and then cause a species of nocturnal emission in women; this hypersecretion occurs only in young women after puberty is reached, and is said to be frequent at the menstrual period.

The causes of inflammation are generally of a venereal kind; repeated coitus or even sexual excitement produces continual congestion of the gland, and increases the quantity of its secretion. In this state the irritation often runs on to abscess; or a bruise, during violent intercourse, will set up inflammation immediately. But a cause far more common than all these is the extension of gonorrhœal inflammation from the vulva along the duct to the gland.

When abscess takes place, the glands of both sides are seldom attacked at once, but in some women they inflame repeatedly; in this case the abscess forms now on one side now on the other.

When inflammation begins, the entry to the vagina grows hot, painful, and very tender; the mucous membrane reddens, and the nympha swells. Before suppuration sets in there is often febrile disturbance for a day or two; the pain becomes throbbing in the gland and aching about the perinæum, and is generally increased during micturition. When the patient is examined, an exceedingly tender oval mass, the size of a nut or even of a walnut, is found at the entry to the vagina; the swelling is doughy and, when matter has collected, fluctuating at one point. Sometimes the pus escapes along the duct as fast as it is formed. In other cases matter forms around the gland, and produces an oval fluctuating tumour between the lesser and greater lip. At times the matter

collects in the duct, of which the mouth has become closed; it then forms a soft fluctuating tumour in the nympha itself, which projects and covers the entry to the vagina. These abscesses usually evacuate themselves either through the excretory duct, or on the inner aspect of the nympha near to it. Less often they perforate the superficial perinæal fascia under which they are situated, and open between the labia. When an aperture is made there is a sudden flow of pus, the tumour disappears, and pus continues to flow away for some time in small quantity until the inflammation subsides and the abscess heals. Guérin says that when the pus has escaped on the inner aspect of the nympha and the place has healed, it often leaves a depressed scar that may be mistaken for that of a chancre. When the abscess opens between the labia it sometimes does not heal, but continues to discharge more or less for an indefinite time. In this condition it is extremely apt to inflame again and again, and cause the patient much trouble.

Diagnosis.—Abscess in Bartholine's gland may be distinguished from abscess in the cellular tissue of the labium majus by its being limited to the furrow between the labia, and by its pointing on the inner side of the nympha, or in the furrow. Abscess coming from the ischio-rectal fossa sometimes points in the labium, but such a tumour is ill-defined, and extends over a greater area; pressure also generally causes much of the matter to return up the fossa; an abscess round Bartholine's gland does not alter its position when it is pressed.

The *treatment* consists in warm fomentations and poultices. When an abscess forms it should be freely opened as soon as fluctuation can be detected. When an obstinate sinus remains, or the gland inflames afresh from time to time, it may be removed by a vertical incision in the fissure between the labium majus and nympha; the gland should then be fixed with a hook, and dissected cleanly out. One or two small vessels usually bleed freely and should be ligatured; the wound then quickly heals. But it usually suffices to lay open the sinus and plug the cavity with lint; closure by granulation then results. When the duct alone is affected by extension of gonorrhœal inflammation, a probe coated with nitrate of silver should be passed along it. If the repeated application of caustic in this way fail to arrest the discharge, it may be necessary to slit up the duct throughout its whole length.

Phlegmonous Abscess of the Labium.—This may be caused by mechanical injury of any kind. It also sometimes follows irritation set up by chancres, follicular inflammation, gonorrhœa, or neglect of cleanliness. It is a frequent disorder among the poorer class of prostitutes. The abscess may form in any part of the labium, which

swells rapidly and grows dusky red; but the looseness of the cellular tissue allows the abscess to reach a great size before it points, and it causes great suffering. For these reasons the matter should always be let out as soon as fluctuation takes place.

Chronic Endometritis.—(Chronic uterine Catarrh; Uterine Leucorrhœa.) This affection may be the result of acute endometritis caused by extension of the inflammation from the vagina; but it also often begins in a chronic form. It is not infrequently produced by the congestion due to frequent and excessive venereal indulgence. Hence it is often met with in prostitutes, and sometimes in newly married women. It is also not uncommon in the later stages of syphilis. But besides these venereal causes there are a host of others depending on constitutional and local derangements of various kinds.

Chronic endometritis is more frequently limited to the cervical portion than is the acute form, but the whole of the interior of the uterus may suffer, and in most cases the parenchyma is also more or less involved.

Symptoms.—The patient complains of pain in the back and about the sacrum, with a sensation of dragging in the groins and weight in the pelvis. She soon becomes tired by walking and standing, which also increase her distress. The most characteristic symptom is leucorrhœa, the fluid being tenacious and viscid like white of egg. This discharge may produce much irritation of the external organs, and sometimes sets up vaginitis if that be not already present. But it usually happens in venereal leucorrhœa that the vagina secretes some part of the discharge, which thus becomes mixed, and when it reaches the external parts is whitish and puriform. Puriform matter comes also from the interior of the uterus when the lining membrane is inflamed, and can often be seen escaping from the os uteri along with the gelatinous clear mucus. The vaginal portion of the womb is enlarged and hard, and the os is patulous with firm margins. When the speculum is introduced, the cervix is seen to be of a livid red colour; it is also often excoriated around the os, which is wide and plugged with the viscid secretion that oozes slowly from it when the patient bears down. The condition of the cervical canal is similar to that of the os; its follicles are enlarged, its colour dark and livid, while the ovula Nabothi are charged with clear secretion.

Treatment.—The constitutional treatment is, as in all uterine affections, of the utmost importance. Though it cannot entirely supplant local treatment, it is a powerful aid to recovery.

The patient should avoid everything likely to interfere with the due performance of the functions of the body. She should take

moderate walking exercise in the open air daily, and be kept free from harassing or exciting mental occupation. The diet should be simple and non-stimulating; wine and beer are to be withheld, unless the enfeebled digestion require the stimulus of a small quantity of sherry or champagne. The bowels should be kept freely open by saline purgatives. In plethoric women the discharge is often associated with disordered digestion and irregularity of the catamenia; and a course of salines, taken during some weeks in sufficient quantity to produce a fluid evacuation of the bowels every morning, is of great service. This may be most advantageously effected by a course of the Cheltenham or Kissingen waters, if pharmaceutical preparations do not suit. Bromide of potassium is also very useful if the nervous system be at fault. In some women, when the system is exhausted or anæmic, preparations of iron are most useful. The sulphate or potassio-tartrate in small doses, or the chalybeate waters of Schwalbach or Harrogate are of great service. The waters of the former place are sometimes successful when the iron given as medicine has altogether failed to improve the health of the patient.

The local treatment consists at first in irrigation of the cervix and vagina for ten or fifteen minutes twice or three times a day with warm water, followed by the injection of some astringent solution (F. 17 to 19). If these means, combined with the general treatment already described, do not suffice to cure the disease, caustics must be applied to the cervical canal; and if the os externum be too much contracted to admit of this, it must be dilated. Before any local application is made, the canal must be thoroughly cleared of the tough tenacious discharge which always collects there. This is often a difficult matter, and various modes of procedure have been recommended for getting rid of it. Dry sponge or absorbent wool on the end of a uterine probe may be tried. Gaillard Thomas advises the use of a syringe made for the purpose, by which the discharge can be sucked out. Another plan is to inject a strong solution of alum to coagulate the mucus, which may then be wiped away with cotton wool. The surface having been cleared by one or other of these devices, some astringent or caustic solution should be applied once or twice a week by means of the uterine probe wrapped with cotton wool. Tincture of iodine sometimes answers well, or a strong solution of nitrate of silver; strong carbolic acid also is often very efficacious, or the probe may be coated with nitrate of silver and applied to the whole extent of the cervical canal. In cases that resist milder measures, fuming nitric acid may be used. This, however, will cause a slough, and when it has come away, one of the milder applications may be used once or twice a week if necessary. In some cases, the intro-

duction into the cervix of sulphate of zinc points as recommended by Braxton Hicks, answers well. After any application to the cervix the parts must be at once cleansed by means of a stream of water, and a plug of cotton wool soaked in glycerine applied to the os. This may be withdrawn by the patient in ten or twelve hours, a thread having been attached to the wool for that purpose.

Granular Erosion of the Cervix Uteri.—This condition may be set up by a variety of causes. Of venereal sources gonorrhœa is a prolific one, by causing inflammation of the cervix. In syphilis catarrhal inflammation also often causes erosion of the os. The irritation of oft-repeated sexual intercourse also excites chronic congestion, inflammation, and abrasion of the mucous membrane; but in whatever way they are produced, erosions of the cervix have very similar characters, and require similar treatment.

The erosion in its simplest form, consists in denudation of the epithelium of one or both lips of the os tincæ. The epithelium of the inflamed mucous membrane of the cervix is loosened, and by the chafing of intercourse or by rubbing against the walls of the vagina, it is stripped off. Sometimes the epithelium is lifted up in minute vesicles or blisters scattered over the cervix; when these break, they leave small superficial erosions. Thus simple erosions are produced in two ways when the mucous membrane is inflamed. The erosion appears as a bright red spot, around which the mucous membrane is generally rosy red and shining. A glairy discharge trickles from the os, and very commonly there is also a purulent discharge from the vagina.

When the disorder which produced the erosion is allowed to run on unchecked, or is increased by continual irritation, small granulations spring up over the denuded surface; these are so closely set and so prominent that sometimes the cervix has a strawberry-like appearance. If the surface is wiped with a pledget of cotton wool, the vascular granulations of the sore will bleed, and sometimes freely; this interferes with the examination, but is of no importance otherwise. The granular erosion often extends into the interior of the cervix. The uterus itself is often hard and enlarged from chronic congestion. This condition, if neglected, may remain for years, causing pain, too great discharge at the menstrual period, and occasional attacks of pain in the back, whenever the congestion is increased from some passing cause. There is always more or less discharge, but in some women it is so slight as to escape their notice. The patient also suffers in other ways; indigestion, irregularity of the catamenia, chlorosis, and nervous irritation, are all consequences of the continual irritation excited.

When the granulations grow to a large size, they project in wart-

like excrescences around the os, and may block up the aperture. They generally secrete a copious purulent discharge and bleed frequently, often to a large amount, especially at the menstrual period. Their readiness to bleed renders them particularly troublesome, and the patient is often much weakened by the repeated hæmorrhage.

Treatment.—The most important thing is to remove the congestion of the uterus. With this object sulphate of magnesia, compound decoction of aloes, or some other aperient must be given two or three times daily. The general health often needs good diet, wine, sea-bathing, and some tonic, of which iron is the most useful form (F. 29, 30).

In the early stage the erosion may often be easily cured. Copious injections of warm water should be employed twice or three times a day, followed by a solution of borax (F. 16). If the cervix is much congested and tender, four or five leeches may be applied to it. When the irritation has been subdued by these means an astringent injection (F. 17 to 19) may be used, and the whole surface of the cervix painted with a solution of nitrate of silver, twenty grains to the ounce. A plug of cotton wool soaked in glycerine should then be applied, and removed in twelve hours. When the surface has become granular, the regular application of caustic to the ulcer is also necessary; solid nitrate of silver may be rubbed in once or twice a week according to the effect produced. When, as often happens, nitrate of silver has no effect on the sore, Vienna paste, strong nitric acid, or the acid nitrate of mercury may be applied: but if these strong caustics are used, the excess should always be washed away as soon as the surface has been sufficiently acted on, by injecting a stream of water on to the cervix through the speculum. Sulphate of zinc, from which the water of crystallisation has been driven off, is very effectual for setting up healing action in the ulcer, though it sometimes causes great pain. Among hospital out-patients, whose attendance is always irregular, the most successful plan of all we have tried at the Lock Hospital is to apply solid nitrate of silver freely, and then introduce a plug of cotton wool holding a drachm of tannin; this the patient wears four days, and during that time she syringes the vagina twice daily with water or weak solution of borax. When she removes the cotton, she syringes freely to clear away the inspissated mucus. The cauterisation and plugging with tannin should be repeated once a week. After four or five weeks of this treatment the granulations have generally very much diminished, or even altogether healed. Scanzoni[1] strongly urges the

[1] Scanzoni: loc. cit., p. 178.

repeated application of leeches to the cervix. This is of great benefit when acute inflammation intervenes, or when there is well marked congestion; but in most cases very little good results from leeching if only chronic induration remains. Iodide of potassium, even in large doses, has apparently but little influence over the indurated cervix, unless the chronic thickening have a syphilitic origin; and in such cases the benefit is far more marked if small quantities of mercury be combined with the iodide. This point has already been adverted to in the chapter on the Treatment of Syphilis.

The most speedy way of treating the granulations when they are very large, is to excise them with long curved-bladed scissors, and to dab the surface, and what cannot be cut off, with caustic solution of nitrate of silver, or of corrosive sublimate. These applications should be made with care, while a large speculum is pushed well to the fundus to protect the vagina from accidental contact with the caustic. Besides the application of caustic, the discharges must be regularly washed away with an astringent lotion. The cauterisation and excision must be repeated from time to time as the granulations grow, until they are destroyed and a healing surface is procured.

FORMULÆ.

GARGLES.

No. 1.

Alum	80—120 grs.
Water	8 oz.

No. 2.

Trisulphate of Alumina	150 grs.
Acetate of Lead	240 grs.
Boiling Water	24 oz.

Dissolve the salts separately. Mix and filter. To the filtrate some form of flavouring material may be added.

No. 3.

Chlorate of Potash	80—160 grs.
Water	8 oz.

No. 4.

Perchloride of Mercury	2—8 grs.
Dilute Hydrochloric Acid	25 min.
Honey or Glycerine	½ oz.
Distilled Water, to	8 oz.

To be used 3 times a day.

The patient must be cautioned as to the poisonous nature of this gargle; and when it cannot be used, a stronger solution of perchloride (4—8 grs. to the oz.) may be applied with a camel's hair brush.

INHALATION.

No. 5.

Creasote	40 min.
Light Carbonate of Magnesia	20 grs.
Water	1 oz.

A teaspoonful in a pint of water at 140°. To be inhaled for five minutes night and morning. Six inspirations should be taken in a minute. (Morell Mackenzie.)

One drachm of Compound Tincture of Benzoin to a pint of water forms a very useful soothing inhalation.

INJECTIONS FOR THE URETHRA.

No. 6.

Sulphate of Zinc	20 grs.
Extract of Belladonna	60 grs.
Mucilage of Acacia	½ oz.
Distilled Water, to	8 oz.

To be used 3 times a day.

The amount of Sulphate of Zinc may be increased from time to time if necessary.

No. 7.

Chloride of Zinc	4—8 grs.
Mucilage of Acacia	4 drs.
Distilled Water, to	8 oz.

Extract of Belladonna may be added if necessary.

No. 8.

Nitrate of Silver	4 grs.
Distilled Water	8 oz.

No. 9.

Acetate of Lead	8—40 grs.
Distilled Water	8 oz.

No. 10.

Acetate of Zinc	8—30 grs.
Distilled Water	8 oz.

The Sulpho-carbolate of Zinc may be used in similar proportion.

No. 11.

Alum	30—40 grs.
Distilled Water	8 oz.

No. 12.

Tincture of Perchloride of Iron	40—80 min.
Distilled Water, to	8 oz.

Begin with the weaker solution, and increase the strength gradually.

No. 13.

Alum, Sulphate of Zinc, Sulphate of Iron, Sulphate of Copper	of each 10 grs.
Distilled Water	8 oz.

This injection is to be diluted at first with three times its bulk of water, and the strength gradually increased.

No. 14.

Subnitrate of Bismuth	60 grs.
Mucilage of Tragacanth	4 drs.
Glycerine	4 drs.
Distilled Water, to	8 oz.

INJECTIONS FOR THE VAGINA.

Nos. 15, 16.

Acetate of Lead, or Borax	40—60 grs.
Distilled Water	20 oz.

Used in the more acute stages of Vaginitis.

Nos. 17, 18, 19.

Alum, or Sulphate of Zinc, or Tannic Acid	60—100 grs.
Water	20 oz.

Used for subacute and chronic vaginitis, erosions of the cervix uteri, chronic uterine catarrh, &c.

LOTIONS.

No. 20.

Solution of Subacetate of Lead	1—2 drs.
Rectified Spirit	½—1 oz.
Distilled Water, to	10 oz.

No. 21.
Carbolic
Glycerin
Distilled

No. 22.
Solution
of Pot
Distilled
Useful as
litic affecti
also for cle
in which c
mon salt sh

No. 23.
Solution
Distilled
Useful as
fœtid discl
bone. Whe
spoonful of

No. 24.

Calomel
Lime Wa

No. 25.

Perchlori
Lime Wa

No. 26.
Tincture
Solution
Spirit of
Glycerin
Rose Wa
Hair Wash.
smi

No. 27.
Tartarat
Distilled

No. 28.
Extract
Distilled
This

MIXTURES.

No. 29.

Quinine ..... 1—2 grs.
Sulphate of Iron ..... 1—2 grs.
Dilute Sulphuric Acid ... 5—10 min.
Infusion of Quassia ..... 1 oz.

To be taken 2 or 3 times a day.

½ dr. to 1 dr. of Sulphate of Magnesia may be added, if necessary.

No. 30.

Tincture of Perchloride of Iron ..... 15 min.
Glycerine ..... 20 min.
Spirit of Chloroform..... 10 min.
Water, to ..... 1 oz.

To be taken 2 or 3 times a day.

No. 31.

Carbonate of Ammonia... 5—8 grs.
Tincture of Opium ..... 5—15 min.
Spirit of Chloroform..... 20 min.
Infusion of Cinchona, to ..... 1 oz.

To be taken 3 or 4 times a day.

No. 32.

Dilute Nitric Acid ..... 10—15 min.
Liquid Extract of Cinchona ..... 10—30 min.
Spirit of Chloroform..... 20 min.
Water, to..... 1 oz.

To be taken 2 or 3 times a day.

No. 33.

Chlorate of Potash ..... 15—20 grs.
Dilute Hydrochloric Acid ... 10 min.
Spirit of Chloroform ..... 10 min.
Infusion of Cinchona ..... 1 oz.

To be taken 3 or 4 times a day.

Useful in ptyalism. Chlorate of Potash may also be prescribed in the form of lozenges or pastilles. Wyeth's compressed tablets are very effective; and the Pastilles de Dethan contain this salt in a very agreeable form.

No. 34.

Van Swieten's Spiritus Anti-Venereus.

Mercurii sublimati corrosivi. ʒss.
Sp. v. r, ex frumento preparati ..... lib. v.

Reliquantur in lagena vitrea donec sponte solutus fuerit Mercurius, agitetur bene phiola et detur usui.

Copied from Max Locher. Observationes practicæ circa luem veneream, epilepsiam, et maniam. Wien, 8vo, 1762.

No. 35.

Solution of Perchloride of Mercury ..... 1 dr.
Solution of Perchloride of Iron ..... 10—20 min.
Spirit of Chloroform..... 10 min.
Peppermint Water, to ..... 1 oz.

To be taken 3 times a day after meals.

No. 36.

Perchloride of Mercury ..... 2 grs.
Sulphuric Ether ..... 1 dr.

Dissolve and add

Cod Liver Oil ..... 6 oz.

1 dr. contains $\frac{1}{24}$ gr. of perchloride.
(Bumstead.)

The bottle must be kept tightly corked, otherwise the Ether will evaporate and the Mercury will be precipitated.

No. 37.

Perchloride of Mercury ... $\frac{1}{16}$—$\frac{1}{8}$ gr.
Iodide of Potassium ..... 3 grs.
Compound tincture of Cinchona ..... ½ dr.
Spirit of Chloroform..... 10 min.
Water, to ..... 1 oz.

To be taken 2 or 3 times a day after meals.

No. 38.

Red Iodide of Mercury..... $\frac{1}{16}$—¼ gr.
Iodide of Potassium ..... 3—5 grs.
Compound tincture of Cardamoms ..... 20 min.
Water, to ..... 1 oz.

To be taken 2 or 3 times a day.

No. 39.

Iodide of Potassium...2 grs. and upwards.
Aromatic Spirit of Ammonia 20 min.
Water ..... 1 oz.

To be taken 3 or 4 times a day in a tumbler of cold water. The quantity of Iodide may be gradually increased about every third day. Infusion of Cin-

chona, or of Quassia, or some preparation of Sarsaparilla may be used instead of water if required.

No. 40.

Iodide of Potassium...5 grs. and upwards.
Bromide of Potassium... 10 grs. and upwards.
Carbonate of Ammonia ..... 5 grs.
Spirit of Chloroform ..... 10 min.
Water ..... 1 oz.

To be taken 3 or 4 times a day in water.

Bromide of Ammonium may be substituted for Potassium, if desired.

No. 41.

Tartarated Iron .....5—20 grs.
Iodide of Potassium...5 grs. and upwards.
Aromatic Spirit of Ammonia 20 min.
Infusion of Quassia..... 1 oz.

To be taken 3 times a day in water.

No. 42.

Iodide of Sodium 2 grs. and upwards.
Aromatic spirit of Ammonia 20 min.
Water..... 1 oz.

To be taken in the same way as No. 39.

No. 43.

Iodide of Ammonium...10 grs. and upwards.
Carbonate of Ammonia ..... 3 grs.
Tincture of Orange Peel ..... 15 min.
Water, to..... 1 oz.

To be taken 3 or 4 times a day, or oftener if necessary, in water.

No. 44.

Zittmann's Decoction.

Sarsaparilla ..... 12 oz.
Water ..... 3 gal.

Macerate for 24 hours.

Put in a linen bag :—

White Sugar..... 6 drs.
Alum..... 6 drs.
Calomel..... 4 drs.
Prepared Cinnabar..... 1 dr.

Hang the linen bag in the liquor and boil down, while adding four gallons more water, till the liquor has evaporated to two gallons. Remove the bag and add to the decoction :—

Anise Seeds ..... 4 drs.
Fennel Seeds ..... 4 drs.
Senna Leaves..... 1½ oz.
Liquorice Root ..... 1½ oz.

Press and strain.

From a pint to a quart to be taken, in divided doses, during the day.

No. 45.

Zittmann's Decoction (Tilbury Fox).

The Strong Decoction. — Sarsaparilla, 12 oz.; Water, 24 pints. Boil for two hours. Then suspend in the liquor by means of a linen bag :—Alum, 1½ oz.; Liquorice, 1½ oz.; Oxysulphuret of Antimony, 1 dr.; Senna Leaves, 2 oz; Aniseed, ½ oz. Remove it from the fire and allow it to infuse awhile. Then strain off 16 pints.

The Weak Decoction.—Take the residue of No 1. Sarsaparilla, 6 oz; Water, 24 pints; Orange Peel, Cinnamon, Cardamoms, of each 3 oz. Liquorice, 6 oz. Infuse for several hours, and strain off 16 pints for use.

The following rules are to be observed in this method of treatment. The patient is to remain in bed, in a room kept between 60° and 70° Fahr. night and day. A purge is given at the outset, and repeated every second or third day. *Diet.* Breakfast: Tea and toast. Dinner: Chop with potatoes or biscuit. Tea: Toast and tea and biscuit. A glass of sherry and a biscuit may be allowed at 11 a.m. if necessary. *Medicine.* Before noon. 2 pints of strong decoction. Afternoon. 2 pints of weak decoction. This treatment is to be continued for about 14 days, after which the patient may be allowed to get up; but he is still to continue taking some of the decoction.

No. 46.

Bicarbonate, or Citrate of Potash .....15—20 grs.
Nitrate of Potash.....3—5 grs.
Ether .....5—10 min.
Tincture of Henbane .....½—1 dr.
Camphor Water, to .....1½ oz.

To be taken every 3, 4, or 6 hours. Used in gonorrhœa. In epididymitis $\frac{1}{12}$—$\frac{1}{4}$ gr. of Tartarated Antimony may be added.

No. 47.

Copaiba..... 20 min.
Essence of Cinnamon..... 20 min.
Mucilage of Acacia ..... 1 dr.
Water, to..... 1 oz.

To be taken 3 times a day, about 2 hours after meals.

No. 48.

Copaiba .....15—40 min.
Solution of Potash.....10—30 min.
Peppermint water ..... 1—1½ oz.

To be taken 3 times a day.

No. 49.

Oil of Yellow Sandal Wood 10—30 min.
Mucilage of Acacia ..... 1 dr.
Syrup.....½ dr.
Cinnamon Water, to ..... 1 oz.

To be taken 3 times a day about two hours after meals.

No. 50.

Oil of Yellow Sandal Wood ..... 1 oz.
Rectified Spirit ..... 2 oz.
Oil of Cinnamon ..... 25 min.

(Henderson.)

1 or 2 drachms 3 times a day.

Copaiba and Sandal Wood Oil may also be prescribed in capsules. These vary in size, according to the maker, but generally contain from 10 to 15 minims each. When a small dose of Copaiba is required, the "Globules de Josephat" each containing 5 minims, will be found very convenient.

There are also a host of different preparations containing various combinations of drugs in the form of capsules. Bell's Compound Cubebs Capsules are often useful. They contain Ethereal Extract of Cubebs, Oil of Copaiba, and Tar.

No. 51.

Gurjun Balsam ..... 1 dr.
Gum Arabic.. .....1 dr.
Syrup of Catechu or of Poppies 7½ drs.
Infusion of Star Anise ..... 10 drs.

To be divided into 2 doses, and taken just before meals, daily.

(Vidal.)

OINTMENTS.

No. 52.

Dissolve 1 drm. of pure Morphia in 5 drms. of Oleic Acid, and mix with the solution 5 drms of Oleate of Mercury (10 per cent.)

No. 53.

Ammoniated Mercury ..... 1 dr.
Oxide of Zinc ..... ½ dr.
Vaseline ..... 1 oz.

No. 54.

Red Oxide of Mercury ..... 1 dr.
Vaseline ..... 1 oz.

No. 55.

Calomel ..... 1 dr.
Vaseline ..... 1 oz.

No. 56.

Calomel ..... 1 dr.
Olive Oil ... . 2 drs.
Lard, sufficient to make a cream.

To be applied with a camel's hair brush, to fissures of the nose and lips.

No. 57.

Powdered Iodoform.....20—60 grs.
Vaseline .....1 oz.

PASTES.

No. 58.

Iodo-Carbon Paste.

Iodoform in fine powder ..... 1 dr.
Wood Charcoal ..... 2 drs.
Glycerine of Starch ..... 2 drs.
Glycerine..... 1 dr.
Oil of Lavender ..... 20 min.

Mix according to art. (Gerrard.)

The paste is pliable and tenacious; and can be easily moulded or spread into a wafer.

No. 59.

Carbo-Sulphuric Paste.

Strongest Sulphuric Acid. } Of each
Willow Charcoal. } sufficient to form a paste.

Mix thoroughly.

This preparation is also known as "Ricord's Paste."

PASTILLES.

No. 60.

Refined Gelatine..... ..... 1 part.
Glycerine..... 2½ parts.
Flavoured Water ..... 2½ parts.
Liquid Cochineal sufficient.
Iodoform ..... 2 grs.

Recommended by Dr. Whistler for syphilitic affections of the pharynx.

One to be slowly dissolved in the mouth 2 or 3 times a day.

PILLS.

No. 61.

Mercurial Pill ..... 1 gr.
Extract of Gentian..... 1 gr.

To be taken 3 or 4 times a day with meals.

No. 62.

Mercury with Chalk (Grey Powder) .....1 gr.
Compound Ipecacuanha Powder, 2 grs.

To be taken 3 or 4 times a day.

May be used instead of No. 61 in cases where there is much irritation of the stomach or bowels.

No. 63.

Mercurial Pill..... 3 grs.
Powdered Opium ..... ½ gr.

To be taken 3 or 4 times a day.

No. 64.

Green Iodide of Mercury ... ½—1 gr.
Extract of Gentian ..... 1 gr.
Extract of Lettuce..... ½ gr.

Make a pill.

To be taken 2 or 3 times a day.

This salt is now prepared in granules by many chemists. In this form decomposition is not so liable to take place.

No. 65.

Green Iodide of Mercury ... ½—1 gr.
Extract of Opium ..... ½—½ gr.
Extract of Logwood sufficient.

Useful when No. 64 purges.

No. 66.

Perchloride of Mercury ..... 1 gr.
Sugar of Milk, sufficient.

Make 10 pills. Varnish.

One to be taken 2 or 3 times a day.

No. 67.

Bicyanide of Mercury ..... 1 gr.
Sugar of Milk, sufficient.

Make 10 pills. Varnish.

One to be taken 2 or 3 times a day.

No. 68.

Compound Pill of Subchloride of Mercury, B.P. (Plummer's Pill).

Subchloride of Mercury, } of each 1 oz.
Sulphurated Antimony, }
Guaiacum Resin, in powder ... 2 oz.
Castor Oil..... 1 fluid oz.
or a sufficiency.

Triturate the Subchloride of Mercury with the Antimony, then add the Guaiacum Resin and Castor Oil, and beat the whole into a uniform mass. Dose, 5 to 10 grs. These pills should be freshly prepared.

No. 69.

Iodoform..... ½—1½ gr.
Extract of Gentian..... 1 gr.

Make a pill.

To be taken 3, 4, or 6 times a day.

No. 70.

Camphor..... 6 grs.
Extract of Opium ..... ½ gr.
Extract of Belladonna ..... ½ gr.

For 2 pills.

1 or 2 to be taken at bed time.

POWDERS.

No. 71.

Calomel ..... 1 part.
Oxide of Zinc..... 2 parts.

For application to mucous patches and fissures of the genital organs or between the toes.

No. 72.

Bicarbonate of Soda.. ..... 1½ dr.
Powdered Sugar ..... 2 drs.
Essence of Lemon ..... 2 drops.

Dissolve the powder in a pint of water, to be drunk during the day.

SOLUTIONS.

No. 73.

Bamberger's Solution of Peptonized Mercury for Hypodermic Injection.

Make a 5 per cent. solution of Corrosive Sublimate in distilled water, also an 18—20 per cent. solution of Chloride of Sodium in distilled water.

Dissolve 1 gramme (15 grains) of flesh peptone in 50 c. c. (cubic centimetres) of distilled water, and filter. To the filtrate add 20 c. c. of the sublimate solution, and then a quantity of the sodium solution (about 15—16 c. c.) sufficient to dissolve the precipitate. Finally, add distilled water until the whole measures 100 c. c.

Each c. c. of the solution contains one centigramme (about $\frac{1}{6}$ grain) of peptonised mercury, which is the usual quantity for each injection.

No. 74.

Ragazzoni's Solution for Hypodermic Injection.

Red Iodide of Mercury	4 grs.
Iodide of Sodium, sufficient to dissolve the Iodide of Mercury.....	4 grs. or less.
Distilled Water	256 min.

Dose.—10 minims (containing about $\frac{1}{6}$ gr.)

This is slightly altered from the original formula, which was prepared with Iodide of Potassium.

No. 75.

Perchloride of Mercury	12 grs.
Flexile Collodion	$\frac{1}{2}$ oz.
Linseed Oil.....	12 min.

For painting fissures of the palms and soles (Sigmund).

This solution should be applied by the surgeon. It is too poisonous to be entrusted to the patient.

No. 76.

Perchloride of Mercury	12 grs.
Ether	$\frac{1}{2}$ oz.

For painting fissures elsewhere than on the palms and soles (Sigmund).

No. 77.

Donovan's Solution.

(Liq. Arsenici et Hydrargyri hydriodatis.)
(Ph. Dublin.)

1 fluid drachm contains $\frac{1}{12}$ gr. of Arsenic; $\frac{1}{4}$ gr. of Mercury; and $\frac{3}{4}$ gr. of Iodine.

Dose.—10 to 30 minims.

No. 78.

Nitrate of Silver	2 drs.
Nitric Acid.....	10 min.
Distilled Water.....	1 oz.

No. 79.

Iodoform	$1\frac{1}{2}$ dr.
Oil of Eucalyptus	1 oz.
Olive Oil	5 oz.

Dissolve the Iodoform in the Oil of Eucalyptus with a gentle heat, and mix with the Olive Oil.

No. 80.

Sulphate of Atropia	4 grs.
Distilled Water	1 oz.

No. 81.

Sulphate of Atropia	1 gr.
Distilled Water	1 oz.

One grain of Sulphate of Zinc may be added if conjunctivitis be present.

SUPPOSITORIES.

No. 82.

For the Nose.

Finely-powdered Iodoform...	2 parts.
Gelatine	1 part.
Gum Arabic	9 parts.

(Gerrard.)

No. 83.

For the Rectum.

The Mercurial Suppository (B. P.) containing 5 grs. of Mercurial Ointment.

No. 84.

Iodoform.....	5 grs.
Cocoa Butter	10 grs.

No. 85.

For the Vagina.

Mercurial Ointment	10 grs.
Cocoa Butter	1 dr.

Make into a suitable form for introduction into the vagina.

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